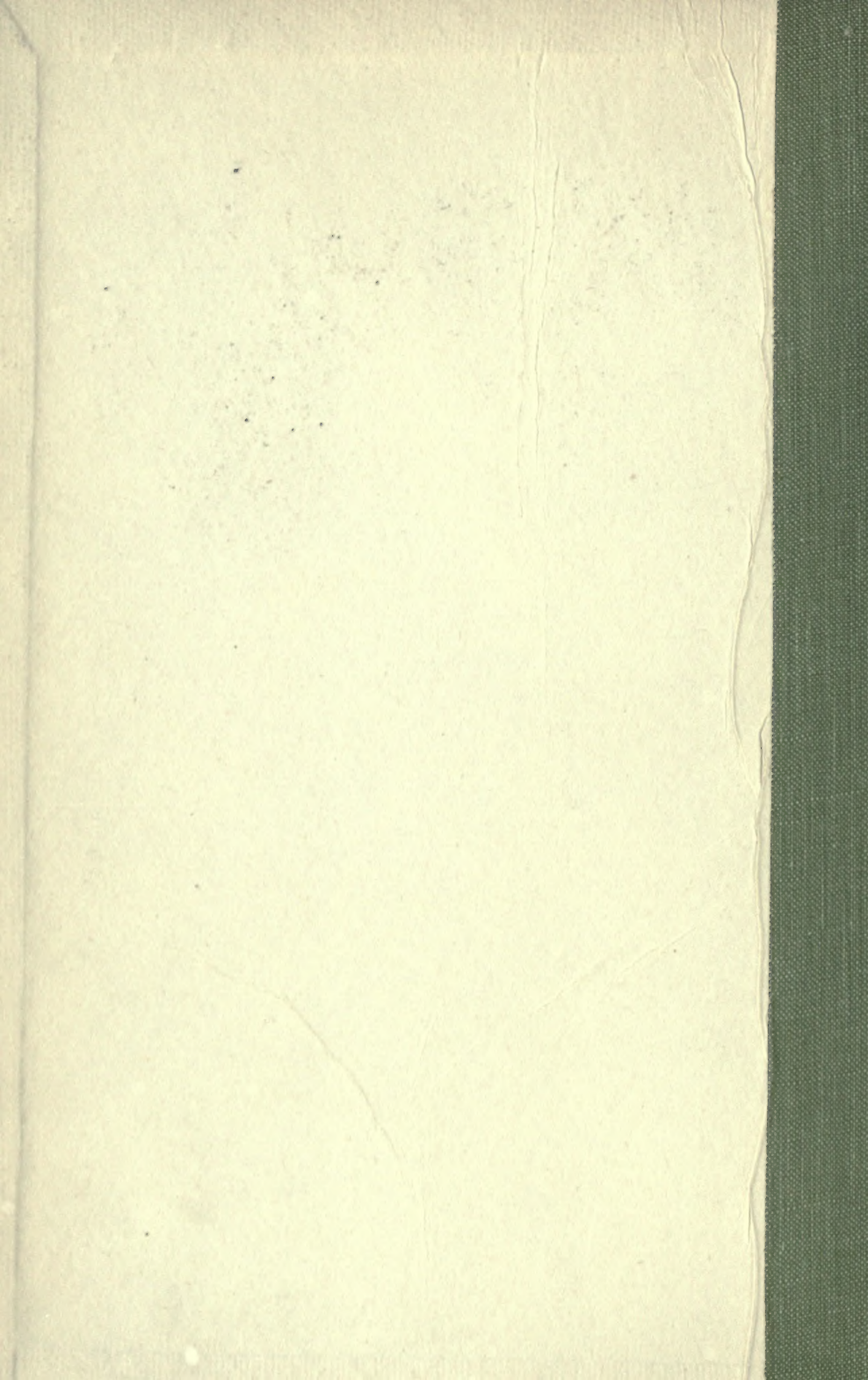


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POPULATION: A STUDY IN MALTHUSIANISM

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POPULATION: A STUDY IN MALTHUSIANISM

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PREFACE

I FIRST began to work on the question of population at the suggestion of Professor Giddings. I soon found that there was a large amount of statistical material bearing upon this subject which had, for the most part, been neglected in the discussions of the growth of population. The effort to make use of some of this material has resulted in this essay. At all stages of my work I have been able to profit by the suggestions and criticisms of a number of the men teaching sociology and economics at Columbia.

I am under special obligations, however, to Professors Cooley and Chaddock who have read the proofs in addition to the other aid they have given me.

W. S. THOMPSON.

ANN ARBOR, *April, 1915.*

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CHAPTER I

THE MEANING OF MALTHUSIANISM

IN undertaking a study of population in relation to the means of subsistence, the first thing to do is to make a clear statement of the meaning of the term Malthusianism. This is necessary both because of a widespread misconception of Malthus' contentions as he modified them in the second and succeeding editions of his *Essay*, and because of the need of a definite statement of his doctrine as it is understood in this study. In giving this account of Malthus' doctrine I shall use the sixth edition of his *Essay*. This edition does not differ materially from the second, but at the same time it embodies his most mature thought upon this question, and therefore is the one from which to get the most complete and accurate statement of his doctrine.

In the first chapter Malthus sets forth his reasons for believing that population, if unchecked in its growth, tends to increase in geometrical ratio while food can only increase in arithmetical ratio. In the second chapter, which is entitled, *Of the General Checks to Population and the Mode of Their Operation*, he makes no use of these two ratios. I shall quote a few passages from this chapter which will show his position clearly. He opens the chapter as follows:

The ultimate check to population appears then to be a want of food, arising necessarily from the different ratios according to which population and food increase. But this ultimate

check is never the immediate check, except in cases of actual famine.

The immediate check may be stated to consist in all those customs, and all those diseases, which seem to be generated by a scarcity of the means of subsistence; and all those causes, independent of this scarcity, whether of a moral or physical nature, which tend prematurely to weaken and destroy the human frame.

These checks to population, which are constantly operating with more or less force in every society, and keep down the number to the level of the means of subsistence, may be classed under two general heads—the preventive, and the positive checks.¹

It is very apparent in this quotation that Malthus does not hold the actual pressure upon food immediately responsible for checking the growth of population under ordinary circumstances. This is made still clearer by his statement of the attitude of mind of a prudent man in a civilized country who is contemplating marriage. He says:

But man cannot look around him, and see the distress which frequently presses upon those which have large families; he cannot contemplate his possessions or earnings, which he now nearly consumes himself, and calculate the amount of each share, when with very little addition they must be divided, perhaps, among seven or eight, without feeling a doubt whether, if he follow the bent of his inclinations, he may be able to support the offspring which he will probably bring into the world. In a state of equality, if such can exist, this would be the simple question. In the present state of society other considerations occur. Will he not lower his rank in life, and be obliged to give up in great measure his former habits? Does any mode of employment present itself by which he may rea-

¹ Malthus, *An Essay on the Principle of Population* (sixth ed., London, 1826), vol. i, p. 12.

sonably hope to maintain a family? Will he not at any rate subject himself to greater difficulties, and more severe labour, than in his single state? Will he not be unable to transmit to his children the same advantages of education and improvement that he himself possessed? Does he even feel secure that, should he have a large family, his utmost exertions can save them from rags and squalid poverty, and their consequent degradation in the community? And may he not be reduced to the grating necessity of forfeiting his independence, and of being obliged to the sparing hand of Charity for support? ¹

This prudential restraint upon marriage Malthus calls moral restraint when it "is not followed by irregular gratifications". He also regards this restraint as the most wholesome, and would like to see its practice increased, for he regards preventive checks and positive checks as varying inversely. ²

In speaking of the positive checks to population, Malthus says:

The positive checks to population are extremely various, and include every cause, whether arising from vice or misery, which in any degree contributes to shorten the natural duration of human life. Under this head, therefore, may be enumerated all unwholesome occupations, severe labour and exposure to the seasons, extreme poverty, bad nursing of children, great towns, excesses of all kinds, the whole train of common diseases and epidemics, wars, plague, and famine. ³

These positive checks, he thought, were rather more directly due to pressure of population on subsistence than the preventive checks. There can be no doubt, however, that he thought of all of them as traceable to this cause.

In closing this chapter, Malthus lays down three propositions which "are intended to be proved":

¹ Malthus, *op. cit.*, p. 13.

² *Ibid.*, p. 17.

³ *Ibid.*, p. 15.

1. Population is necessarily limited by the means of subsistence.

2. Population invariably increases where the means of subsistence increase, unless prevented by some very powerful and obvious checks. [A note by Malthus is omitted].

3. These checks, and the checks which repress the superior power of population, and keep its effects on a level with the means of subsistence, are all resolvable into moral restraint, vice and misery.

The first of these propositions scarcely needs illustration. The second and third will be sufficiently established by a review of the immediate checks to population in the past and in the present state of society.¹

In view of what has been brought forward here, it is apparent that Malthus himself attached very little importance to the exact statement of arithmetic and geometric ratios in the growth of the means of subsistence and population. His discussion of positive and preventive checks also shows that he was not unaware of the social and economic complications of the question, as does also his specific treatment of these checks in the various countries which he studies. He finds preventive checks at work in every country. These preventive checks he traces very carefully into their social ramifications and shows a truly remarkable understanding of the immediate motives which are at work.

When Malthus' own statement of his position is studied, many of the criticisms made upon his doctrine become meaningless. For he did not hold many of the views often attributed to him. He specifically says that lack of subsistence is not the immediate cause of checking the growth of population except in case of famine. He then proceeds, as I have already shown by quotations, to enumerate the preventive motives which he thinks play so important a

¹ Malthus, *op. cit.*, pp. 23, 24.

part. But, of course, he has in his mind all of the time that these preventive motives are really brought into play because of the hardships which would have to be endured if the course of nature were followed without restraint.

The doctrine of Malthus is not refuted by showing that the population of any given country is not limited by the food which it produces. This is not one of his explicit propositions, although in his discussion of the checks operative in the various countries he seems to clearly imply that their populations are to all intents limited by the food which these countries can produce. This was true in a large measure in his day, and has only ceased to be true because of the cheap carriage due to the improved means of transportation. But this part of his argument has no organic connection with his main proposition, which remains unaffected by the attacks upon his foresight in this matter.

The main proposition which Malthus puts forward is that "Population invariably increases where the means of subsistence increase, unless prevented by some very powerful and obvious checks".¹ I wish to quote here also a part of a note which Malthus adds in connection with the above:

It should be observed, that, by an increase in the means of subsistence, is here meant such an increase as will enable the mass of the society to command more food. An increase might certainly take place, which in the actual state of a particular society would not be distributed to the lower classes, and consequently would give no stimulus to population.²

Malthus thought it followed from this proposition that population was always pressing on the actual food supply unless these "very powerful and obvious checks" were

¹ Cf. *supra*, p. 12.

² Malthus, *op. cit.*, p. 24.

present. He regarded misery in almost all of its forms as proof of his position, and he also believed that much of what he called "moral restraint" was due to the fear of misery.

The Malthusian position then really is this: Although at any normal time there is food enough to keep alive all members of the population, yet it is only actual pressure upon subsistence (operating in certain portions of the population) or fear of pressure (which assumes manifold forms) which keeps population from multiplying more rapidly than it actually does.

It may appear to some that this statement of the Malthusian principle of population is not in accordance with the real thought of Malthus. I can only say in reply, that the quotations I have given seem to bear me out and that I can see no other interpretation which a careful and unbiased study of the *Essay* will warrant. It is, of course, impossible in this place to adduce every statement which has a direct bearing upon this matter. Besides, it is very difficult to convey the spirit of a work by picking out a passage here and there as I have of necessity done.

To bring out more clearly the meaning of this positive statement of Malthus' doctrine, it may be well to state some of the things which it does not mean, since so many different interpretations have been put upon it. In the first place, it does not mean that actual fear of the want of food is the ever-present motive in the minds of all people which keeps them from rearing large families. In the second place, it does not mean that all of any population is in want at any given time. That is to say, Malthus clearly recognizes that in different classes of the population the procuring of the means of subsistence has different effects as regards the size of families, and therefore on the growth of population.

In addition, he calls specific attention to the oscillations in the growth of populations. He devotes considerable space to showing how it could come about that a population could be almost stationary at one time and increase rapidly at another time. He does not definitely prove that this has been the case, because he lacks the statistics which would enable him to do so. Furthermore, Malthus saw that the system of distribution which prevailed in a nation had its influence on the growth of population. He saw that if the increase of food produced went to the upper class in the form of new luxuries, it would have no effect in relaxing the pressure upon the laboring classes. It is only an extreme form of this idea which some modern reformers voice when they say that our system of distribution is to blame for all economic ills. Malthus would not agree with this extreme view, but he would freely admit that at any given time—except famine times—there was food enough to keep all alive, and no doubt he would also agree that a better distribution would for the moment relieve many human ills. His main contention is, however, that such a distribution would be of only momentary benefit. The lower classes of the population would soon be at the subsistence level again. For

In every country some of these checks are, with more or less force, in constant operation; yet, notwithstanding their general prevalence, there are few states in which there is not a constant effort in the population to increase beyond the means of subsistence. This constant effort as constantly tends to subject the lower classes of society to distress, and to prevent any great permanent melioration of their condition.¹

There are, then, two main parts to Malthus' thesis. The first relates to the tendency of population to increase in

¹ Malthus, *op. cit.*, p. 17.

numbers with the increase in production of food; the second relates to the effect of this increase upon the lower classes of the population where the burden falls. The first part may be stated in another way, viz., that the supply of labor tends to increase faster than the demand for it—except under unusual conditions. He considered most of the evil which could be called misery and vice as proof of this contention. Naturally this led to the other part of his thesis. If the supply of labor was tending to increase faster than the demand for it, there would not be sufficient of the necessities of life to go around, and the result would be a lower class which was always suffering from a lack of them. But it would be a mistake to think that Malthus looked upon the evils of over-population as altogether without remedy. He did maintain that there would always be suffering due to this cause, but the following passage will serve to show that he believed this would become proportionately less as civilization advanced:

From a review of the state of society in former periods, compared with the present, I should certainly say that the evils resulting from the principle of population have rather diminished than increased, even under the disadvantage of an almost total ignorance of the real cause. And if we can indulge the hope that this ignorance will be gradually dissipated, it does not seem unreasonable to expect that they will be still further diminished. The increase of absolute population, which will of course take place, will evidently tend but little to weaken this expectation, as everything depends upon the relative proportion between population and food, and not on the absolute number of people. In the former part of this work it appeared that the countries, which possessed the fewest people, often suffered the most from the effects of the principle of population: and it can scarcely be doubted that, taking Europe throughout, fewer famines and fewer diseases arising from

want have prevailed in the last century than in those which preceded it.

On the whole, therefore, though our future prospects respecting the mitigation of the evils arising from the principle of population may not be so bright as we could wish, yet they are far from being entirely disheartening, and by no means preclude that gradual and progressive improvement in human society, which, before the late wild speculations on this subject, was the object of rational expectation. To the laws of property and marriage, and to the apparently narrow principle of self-interest which prompts each individual to exert himself in bettering his condition, we are indebted for all the noblest exertions of human genius, for everything that distinguishes the civilized from the savage state. A strict inquiry into the principle of population obliges us to conclude that we shall never be able to throw down the ladder, by which we have risen to this eminence; but it by no means proves, that we may not rise higher by the same means.¹

I am aware that the meaning which I have ascribed to Malthus' doctrine does not agree with what is usually understood by the term Malthusianism. Most men discuss his doctrine as set forth in the first edition of the *Essay*. In this edition his view is decidedly pessimistic. He holds that man is doomed to perpetual suffering because there is a strong tendency for population to exceed the food supply, and that this tendency cannot be checked. In the passages just quoted from the last chapter of the sixth edition of the *Essay* he modifies this view. He does this because greater experience and study have convinced him that progress has been made in the mitigation of human suffering due to overpopulation and because he believes still further progress is in sight. It seems to me, then, that it is only fair to Malthus to give this modified view the name of Malthusianism and

¹ Malthus, *op. cit.*, vol. ii, pp. 440, 441.

not to associate this word solely with the earlier views which he expressed, as is usually done. If more mature reflection and wider study convinced Malthus that his earlier doctrine was extreme, then his name should be associated with the results of his later work as well as his earlier, and we should think of him as the author of the sixth edition of the *Essay* as well as of the first.

CHAPTER II

VIEWS ON POPULATION HELD BY SOME OF THE RECENT WRITERS ON ECONOMICS

THE purpose of this chapter is to give an idea of the present state of opinion among economists regarding the doctrine of population. The views which are brought forth here will not be criticized; they will be studied merely to ascertain the chief points of agreement or disagreement with the doctrine of Malthus as given in the preceding chapter. This seems to me the best method by which to bring forth their salient features in a brief manner.

Professor Ely speaks of the situation of India as well illustrating the actual check of population by lack of food in years of crop failure. Here in famine times the birth rate decreases and the death rate increases, while in the year following, if it is a normal year, the death rate decreases and the birth rate increases. We do not find this condition in the nations which have accepted the methods of production in use in western civilization, and so some economists are inclined to look upon famines as special cases, and therefore credit the lack of food with little significance as regards the growth of population. He then reviews briefly the growth of population in the nations which have accepted the modern methods of production. He finds proof here of an increase of food bringing about an increase of numbers of men, and he concludes as follows:

In view of these facts it is impossible to deny a large amount of significance to the Malthusian theory of population. Population has generally increased wherever the increase in wealth

has afforded it opportunity. Yet it does not follow that the Malthusian theory is, in its strictest interpretation, true.¹ Population has not increased as *rapidly* as wealth has increased. Average real incomes are very much higher than they were before the Industrial Revolution—a statement that holds true for average real wages as a particular form of income. Interpreted in the light of the theory of diminishing productivity, this means that population has not increased so rapidly as capital and the available supply of land have increased. If there had been no increase in population during the last one hundred and fifty years, the marginal productivity of labor would (if, nevertheless, modern methods of production had been developed) have been very much higher than it is, and wages would have been correspondingly higher than they are.²

Thus it is seen that Professor Ely accepts the first part of the Malthusian doctrine as substantially true. He does not express himself regarding the second part of the doctrine.

Professor Alfred Marshall's views can be given best by quoting, since they are concisely stated. He says:

Malthus' reasoning consists of three parts, which must be kept distinct. The first relates to the supply of labour. By a careful study of facts he proves that every people, of whose history we possess a trustworthy record, has been so prolific that the growth of its numbers would have been rapid and continuous if it had not been checked either by a scarcity of the necessities of life, or some other cause, that is, by disease, by war, by infanticide, or lastly by voluntary restraint.

His second position relates to the demand for labour. Like the first it is supported by facts, but by a different set of facts. He shows that up to the time at which he wrote no country (as distinguished from a city, such as Rome or Venice) had been able to obtain an abundant supply of the necessities of life after its territory had become very thickly peopled. The

¹ This probably refers to the doctrines of the first edition.

² Ely, *Outlines of Economics* (New York, 1908), p. 376.

produce which Nature returns to the work of man is her effective demand for population: and he shows that up to this time a rapid increase in population when already thick had not led to a proportionate increase in this demand. [Marshall's note not quoted here. *Supra*, pp. 9, 10.]

Thirdly, he draws the conclusion that what had been in the past, was likely to be in the future; and that the growth of population would be checked by poverty or some other cause of suffering unless it were checked by voluntary restraint. He therefore urges people to use this restraint, and, while leading lives of moral purity, to abstain from very early marriages. [Marshall's note omitted.]

His position with regard to the supply of population, with which alone we are directly concerned in this chapter, remains substantially valid. The changes which the course of events has introduced into the doctrine of population relate chiefly to the second and third steps of his reasoning. We have already noticed that the English economists of the earlier half of last century overrated the tendency of an increasing population to press upon the means of subsistence; and it was not Malthus' fault that he could not foresee the great development of steam transport by land and by sea, which have enabled Englishmen of the present generation to obtain the products of the richest lands of the earth at a comparatively small cost.

But the fact that he did not foresee these changes makes the second and third steps of his arguments antiquated in form; though they are still in great measure valid in substance. It remains true that unless the checks on the growth of population in force at the end of the nineteenth century are on the whole increased (they are certain to change their form in places that are as yet imperfectly civilized) it will be impossible for the habits of comfort prevailing in Western Europe to spread themselves over the whole world and maintain themselves for many hundred years. But more of this hereafter. [A note by Marshall is omitted.] ¹

¹ Marshall, *Principles of Economics* (sixth ed., London, 1910), pp. 178-80.

Thus we see that Professor Marshall also accepts the first part of the doctrine of Malthus as substantially sound, and in other portions of his work he also accepts the second part, although modifying it to some extent.

Professor Taussig opens his discussion on population with a statement of the maximum birth rate and the minimum death rate. By subtracting the latter from the former he finds that it would be possible for the human species to double its numbers in a period of about 23 years. So he holds to the statement that population has a tendency to increase at a geometrical ratio every 23 to 25 years. He defines the word tendency as meaning "that there are forces in operation which unless counteracted will bring about the given result."¹

He then proceeds to an examination of the birth rates and death rates of several of the European countries to see whether he can find in these rates any evidence that any portion of the population is pressing on the means of subsistence. Roumania, Hungary, Saxony, Bavaria and Italy all have high birth rates and high death rates, and this indicates that population is trying to increase faster than food is increasing. The Malthusian principle is at work in these countries. The same is true of those countries which have a high rate of infant mortality. In some of the countries as high as 20 per cent to 25 per cent of the children born fail to live one year. Those countries which do not show a high death rate but have a moderately high birth rate, often have a large amount of emigration, which has the effect of relieving the pressure on food for the time being.

Professor Taussig then goes on to say:

High birth rates, high death rates, backward industrial conditions, low wages,—these commonly go together. But which is

¹ Taussig, *Principles of Economics* (New York, 1911), vol. ii, p. 212.

cause and which is effect? The unqualified Malthusian view is that the pressure of population, indicated by a high birth rate, is the cause from which all the evils flow, and that the one effective mean of improvement is a lowering of the birth rate. But the situation is not quite so simple as this.¹

After showing that all these factors work together as causes and effects, he continues:

None the less, it is clear that restraint on the increase of numbers is one essential condition of improvement. Stated in this way the Malthusian position is impregnable. A limitation in numbers is not a *cause* of high wages, but it is a *condition* of the maintenance of high wages."²

After a brief discussion of the standard of living, age of marriage, and decline of the birth rate as factors in the growth of population, he concludes that "individualism is at the root of the phenomenon".³ By individualism he means the "desire of each individual to improve his condition".⁴ He seems to think that this is the preventive check which will come to operate to keep population down so that the positive checks will become inoperative. He even thinks it likely that in the advanced countries the preventive checks are being carried too far. His outlook on the future is very naturally different from that of Malthus, since he sees some slight danger of race suicide in the operation of the preventive checks. But more than this, he believes that the able and intelligent men are preponderantly among the classes in which these checks operate most strongly, and so fears race deterioration unless these classes hold their own in the matter of numbers.

¹ Taussig, *op. cit.*, vol. ii, p. 220.

² *Ibid.*, p. 221.

³ *Ibid.*, p. 232.

⁴ *Ibid.*, p. 231.

Aside from these exceptions Professor Taussig's views are substantially those of Malthus. The principle of population is applicable he thinks to certain classes among all people although it applies less and less as a people rises in the scale of civilization.

Professor Gide, after recounting the rate of increase of population of some of the nations in modern times, goes on to show what would be the consequences of such a rate of increase if it were continued for a very long period. To know the causes which would prevent such an increase, he says, would be to know the law of population. He seems to think that biology will give us this law. He then gives the theory of Spencer that the fertility of any species varies inversely with the development of the individuals of that species. He expresses the hope that as the race advances mentally and morally the fecundity of the human species will slacken.

Thus Professor Gide holds that at present population does press upon the food supply, but this state will probably not continue long. He looks for the slackening in the growth of population to take place in an entirely different manner from what Malthus thought it would. For he looks to biological changes in the human organism to bring about a reduction of human fertility.¹

M. Levasseur shows statistically that consumption of foodstuffs has proceeded faster than their production in the countries of western Europe in the latter two-thirds of the nineteenth century.² This has only been possible because of the greatly increased productiveness of industry in general. This he thinks proves that population has not been pressing upon the food supply. We must take account

¹ Gide, *Principles of Political Economy*. Translated by E. P. Jacobsen (Boston, 1891), pp. 320-23.

² Levasseur, *La Population française* (Paris, 1889-92), vol. iii, ch. ii

of the foreign commerce of a nation in foodstuffs, and when we do this we find that the population of these countries has not been increasing as fast as their food supply, and so the proposition of Malthus has been controverted.

He then proceeds in Chapter III of the same volume to make a statistical study of the growth of riches in general, and the growth in population. In this he shows that the growth in riches has been more rapid than that of population. He supports this view by showing the change which has taken place in the manner of living. I quote:

What has become of the time when the entire family of a small shopkeeper of Paris gathered around a single candle in the evening, when the workman breakfasted on the corner of a table in his workshop with two sous worth of bread and the same amount of fried potatoes, when the good merchants planned for a Sunday picnic in the woods of Boulogne, and carrying in their baskets the cloths, dishes and food, spread their table upon the grass? It is far behind us, sixty years and more away, and the present generation, which has different customs will not restore it to us. . . . It prefers the tramways and the railway carriages of the Porte Saint-Denis and it is proper to do so. But if in Paris, in 1889, this mode of living has furnished 330,000,000 passengers to the omnibuses, tramways, small carriages and boats on the Seine and if the letters delivered by the railroads passed 230,000,000 in the same year it is necessary that more should be paid for moving about than our ancestors paid when they did not have the railways.¹

Then he mentions some more of the ways in which we are better off than our ancestors and proceeds to state his belief with regard to the continuation of the present prosperous condition of the civilized nations:

¹ Levasseur, *op. cit.*, vol. iii, p. III.

Thus the nineteenth century has fortunately contradicted the prophecies of Malthus. Will the twentieth have the same fortune? Science, steam, mechanics, chemistry, electricity have been prodigal of their favors to those who mastered them. From this resulted a growth of production which has never been seen hitherto. It is this which in part explains why riches have grown faster than population. ¹

He believes that we do not know enough regarding the application of the law of diminishing returns to the newer industries to justify the fear that the present rate of progress in economic production cannot continue, for he says:

We will content ourselves with remarking that the known facts do not justify such apprehensions. Man did not know, or recognized but dimly a hundred years ago the use of the forces and materials of nature which have so greatly enriched him. Does he know to-day all those which nature has hidden in her bosom? Electricity has only entered upon the scene; aluminum of which the earth contains an immeasurable quantity, only awaits a less costly process of manufacture in order to become a useful metal of the first order; the tide, the force of which is renewed each day and is inexhaustible, is ready to furnish power when coal becomes rare; the past and present seem to bear guarantees for the future; humanity need not arrest itself upon the way of progress by thinking that this way, of which it cannot perceive the end, cannot prolong itself into infinity. ²

M. Levasseur certainly could not be classed as a believer in the doctrine of Malthus. He sees no pressure of population upon food supply. The progress of scientific production has relieved the pressure, and relieved it (presumably) for all time. It is evident that he has in mind here the

¹ Levasseur, *op. cit.*, vol. iii, pp. 112, 113.

² *Ibid.*, vol. iii, p. 113.

French people in particular, and this brings us to the most striking feature of his whole treatment of the question. In stating Malthus' position, he does it with great fairness and seems to understand it thoroughly. In his own treatment, however, he looks at the whole question from the point of view of national economy. His attitude is that of a man studying a single nation. This is perfectly legitimate, of course, but it is surprising that he does not seem to recognize that Malthus' doctrine was not meant to be confined to any given time or people. He seems to think that the facts he has produced overturn the doctrine of Malthus, whereas, they are really only a special case of the alternate pressure and release of pressure which Malthus called attention to. His observations are based on so narrow a set of facts that his conclusions cannot have the validity which he seems to think they have, unless it should happen to be the case that his study is typical of many others which are yet to be made.¹

F. S. Nitti divides his work on *Population and the Social System* into two books. The first is taken up with an endeavor to show that all the theories of population hitherto advanced have been due to special and extraordinary social situations. Each author of a theory has been subject to certain specific influences which have made his theory of momentary value only. There have been certain political, economic and social events which have so acted upon the thought of these men that they have not been able to state anything of universal validity, although many of them have thought that they had done so.

¹ This statement of M. Levasseur's position may possibly seem unfair at first inasmuch as his great work is avowedly upon the French population. But a perusal of chapters i, ii, iii, vol. iii, will convince any one that he intends this part of his work to have a universal application.

In Book II, then, Nitti sets forth what he considers the true law of population. It is rather difficult to state his position, for he is scarcely consistent. I shall endeavor to state his theory with a view to emphasizing those points which seem to me to be characteristic of the spirit of his discussion. I shall first quote a passage which seems to me quite contrary to the views he holds, and shall leave it to the reader to decide whether this passage should have much weight in view of what follows. He says:

It is well to note here that the automatic excess of population, which occurs in the three primitive periods, the barbarous, the pastoral, and the agricultural, and also, although in a slighter degree, in the fourth, has been the greatest cause of human progress, since it has compelled entire populations to either undergo a transformation or to decay, and it has forced the primitive civilization to leave the static period and to enter upon the dynamic period. But as humanity became civilized, and as the last two phases (the industrial and commercial civilizations) succeeded to the three earlier, so the production of men has always proportioned itself to the production of the means of subsistence.¹

Contrast with this the following:

The birth-rate is subject to laws which were utterly unknown to Malthus and the Malthusians. We have seen nations enter upon a period of great civilization, become rich, have a very dense population, and then suddenly become unpopulous and decadent from a slow *anemia*. And on the other hand we have seen nations which long remained in a state of slight civilization, become rapidly populated and the centres of a new civilization under the influences of external causes. Many ancient civilized states came to an end not by invasions or war, but solely by a cessation of the birth-rate.

¹ Nitti, *Population and the Social System*. Translated under the direction of the author (London, 1894), p. 112.

Malthus' law explains nothing just as it comprehends nothing. Bound by rigid formulas which are belied by history and demography, it is incapable of explaining not only the mystery of poverty but the alternate reverses of human civilization.¹

Again he says :

The problem of population must be chiefly considered from the standpoint of the distribution of wealth with which it is strictly bound up. We can assert that *a country* which, in the actual form of economic constitution, is capable of sustaining a certain number of individuals, could sustain a much greater number when the economic form is changed in the direction of a wider distribution of the wealth produced. Against this truth, essential to anyone who would thoroughly grasp the phenomenon of population, some theorists have ventured to raise arguments, which do not well sustain even the slightest scrutiny.²

Of course all men recognize that there is food for those who are alive. But, aside from recognition of this fact, Nitti means that population grows according to the social conditions in which people live, and not according to the greater or less intensity of the pressure upon food supply. He even goes so far as to say that

The famines of the past, which seemed to Malthus to be the terrible penalty inflicted by nature upon those who attempted to do it violence by wishing to sit at the banquet of life, when all the places were taken, were caused, as we have already said, by the insufficient market and the economic order, and not by natural causes.³

He reviews very briefly a large number of social factors

¹ Nitti, *op. cit.*, p. 114.

² *Ibid.*, p. 102.

³ *Ibid.*, p. 96.

which he considers important in their influence upon the birth rate. In many instances he uses statistics in support of his position, and considers that he has proved his thesis, as many passages testify. But near the end he seems to waver, for he introduces the theory of Spencer regarding the relation of individualization and power of reproduction.¹ This seems like an instinctive shrinking back from the position which he has so laboriously upheld. It seems to indicate a sort of extra-rational feeling that if the present system of distribution were bettered so that the present checks upon population were released, there would be a tendency to growth which would need to be counteracted by some new checks. But aside from a few slips to which I have alluded, Nitti is a thoroughgoing anti-Malthusian. He can see no truth in the statement that population, because of a tendency to rapid increase, presses upon the food supply, and thus brings a certain amount of misery upon itself.

Professor Patten sees in the industrial life of the day a new basis for civilization. He says:

Those who would predict tomorrow's economic states from a study of the economic states of Rome or Venice overlook the difference between a society struggling to meet a deficit and one so well situated that thought can be centered on the equitable distribution of a surplus. In the one case the civilization must develop its traditions to keep the deficit as small as possible and eventually to overcome it, and in the other to utilize the surplus for common good, not to undermine energy and productive ability or to create parasitic classes, but to distribute the surplus in ways that will promote general welfare and secure better preparation for the future. The one type of society may be called a pain or deficit economy, the other a pleasure or surplus economy. All civilizations before the nine-

¹ *Cf. supra*, p. 24.

teenth century, like the primitive societies of the Western world to-day and the backward despotisms of the East, were realms of pain and deficit, in which traditions and experiences of men were moulded out of the general menaces to life and happiness. When adjustment to nature was defective at many points and lacking altogether at others, forecasts of evil were proved true by the event, and men learned to expect calamity and disorder. If nations established themselves in rich localities where they might have built stable institutions upon natural resources, other nations warred upon them without let or hindrance, and the contests exhausted the land. In short the story of the rise and fall of nations, repeated again and again, seems to justify the familiar conclusion that the decline of a society after an epoch of prosperity is a natural, incontrovertible law. But are these sad endings the fit sequels of man's ill doing in a one-time perfect world, as certain moralists have affirmed, or are suffering and defeat the outcome of the purely physical conditions of existence? If the latter, improvements in the environment will construct a new basis for civilization by lessening deficit and destroying the old status between men and nature.¹

He scouts the law of diminishing returns by enumerating the factors which are at work to make our agriculture more productive. His general attitude is shown in the following passage:

Each gain upon nature adds to the quantity of goods to be consumed by society, and lessens the labor necessary to produce them. Improved conditions make better men, and better men improve conditions. Professor Shaler says men can double the food supply of the world by expansion of population and double that by engineering devices; if it be true, American possibilities exceed even his amazing estimate, for we occupy one of the most fertile regions of the globe. The fall

¹ Patten, *The New Basis of Civilization* (New York, 1907), pp. 9, 10.

in the rate of business, the eagerness to invest daringly, the alertness of capital to enter new business, the widespread security of investments, the "saving instinct" which has become a constant, half-automatic pressure toward the growth of funds,—these economic truths have been so minutely illustrated by special observers that it is scarcely necessary to assume a general doubt of the nation's present ability to give work to hordes of men equipped with an average physique and some intelligence.¹

He then goes on to show how the standard of living has been on the rise in recent years, and in a burst of enthusiasm pictures the abundance and variety on the laborers' tables in the following passage:

Rapid distribution of food carries civilization with it, and the prosperity that gives us a Panama Canal with which to reach untouched tropic riches is a distinctive laborer's resource, ranking with refrigerated express and quick freight carriage. The produce which the railroads bring to cities have made ice a commonplace of the larder. Without it, milk would cease to flow into New York from Adirondack farms four hundred miles away; it opens a market for fresh fish to people who have hitherto eaten it only in oil or in a dried form; it gives options upon the winter's market as well as upon the summer's, and adds many perishable fruits and shortlived vegetables to the laborer's menu. In the Philadelphia ghetto one may watch a huckster's wagon, filled with strawberries costing three and four cents a box, move down the block and go away empty on a day when a box uptown is not to be found at less than ten cents. Other wagons offer lettuce, celery, corn, and spinach banked crisply against the blocks of ice in the wagon bed. Banana carts make their rounds during the whole year with excellent fruit for ten and eight—and late on market nights for six cents a dozen. The consumption of bananas among the

¹ Patten, *op. cit.*, pp. 16, 17.

poor is very large; it may be said to have become a staple without regard to previous food customs because of its small waste, its solid nutriment, and its low price. Like sugar, the banana can never again be a luxury; its simplicity and economy of preparation and its compact food values have added it permanently to the laborer's fund of goods.

It is the worker who reaps the advantage of food bargains not to be found in stationary shops. The huckster whose expenses are low offers his wares late at night and calls to the windows many purchasers who have waited for him to take advantage of the exigencies of ten o'clock. The daytime commissary of the street, spread on stands and hawked from baskets, also feeds the children more delicately than they were fed in their fathers' countries. Much is unwholesome, much is adulterated, but the food is unstintedly there, and plenty does not fail.¹

I will quote yet another passage in which he asserts that the law of increasing returns is in operation and is to form the basis of this new civilization:

Each gain upon nature adds to the quantity of goods to be consumed by society and lessens the labor necessary to produce them. In one form the surplus is stored in individuals as surplus energy; in another it is in the goods produced by this energy. Goods become utilities in consumption, utilities are transformed into energy, and energy as work creates new goods. The surplus is not conserved as a permanent fund, but exists and grows only as it is perpetually transformed from goods to energy and from energy back to goods. Life, work, and happiness are thus bound together and their measure is the surplus that vitalizes them. It relieves the present from the menace of a deficit which our forefathers constantly faced and feared. As a concept of our social thinking it differentiates the new from the old and helps to drive away the mists that

¹ Patten, *op. cit.*, pp. 22, 23.

blur clear thinking. But states of mind are hard to change, and in truth those we so long ago adopted seem to find ever fresh justification in the evils which remain to afflict men long after their inciting causes have disappeared, and in the old wounds of humanity it is easy to see new proofs of accustomed beliefs. The strongest arguments can be presented just as their foundations are crumbling to decay. We know that the military state is gradually being displaced by the industrial state, and yet there was never a time when the power and efficiency of armies were as great as now. They hold the nations in their power just when the disintegration of the forces beneath them is most apparent. And so it is with the evils more directly associated with the industrial world. The poverty, misery, exploitation, oppression of the poor; the greed, indifference, and power of the rich, are glaring truths even while the basis of a new economic order becomes more and more plain. In the age of transition the old thought and the new world abide side by side. But if the foundations of our civilization have been changed, the altering status of men will take clearer aspects in each new age, and the old thought, while apparently verifying the old premises anew, will gradually disappear—not because it is argued away, but because men's sentiments are changed by new activity and an accumulating store of fresh experiences.¹

I have quoted these passages in order to show as accurately as possible the view Professor Patten advances, because, it seems to me, it is quite characteristic of a large body of thinkers on social problems at the present time. This view is accepted by a large part of those who are engaged in social work. They need some basis for optimism, and they find it in a surplus of material goods. With this surplus to draw upon, and a still larger surplus to look forward to, they see no problem to-day but that of a more equal dis-

¹ Patten, *op. cit.*, pp. 26, 27.

tribution. They see a solution of almost all social ills in an abundance of the physical necessities of life. They also hold that there is no danger of population expanding at such a rate that it will catch up with this surplus and exhaust it. So it is that they see the complete refutation of Malthus in the actual and prospective productiveness of modern industry.

This chapter has already run to such length, that I shall not take up the positions of other writers in any detail. I shall merely quote a few short passages which will show the positions of these men as accurately as short quotations can do.

It might seem, then, that Malthus was right in his premises; and since the preventive considerations are proverbially weak in the poorer classes, it might be claimed that he was also justified in his gloomy forebodings. This conclusion, however, does not follow. The real antithesis is proximately at least not between population and food, but between population and wealth, or productive efficiency. . . . Even granting this contention (the contention being that in time all arable land may be taken) however, and looking forward to the distant time when all the huge and now uncultivated areas of the earth's surface will be utilized for food production, it still remains true that the increase of wealth may for almost indefinite periods keep ahead of population. For, as was intimated in the last chapter, a really intensive capitalistic system of agricultural production has never yet been attempted on a large scale. If there is enough wealth to put into the soil, it can be transmuted into food. The diminishing returns from land can be arrested by the increasing returns of a rapidly augmenting efficiency of industry in general. The food may indeed cost more, but there will be more wealth with which to buy it.

Not only can wealth be made to increase faster, but, as we have seen, the increase of wealth will in itself set in motion those economic and sociological forces which tend to reduce

the rate of increase of population. Thus from both sides the antithesis of wealth and population may be weakened. Under favorable conditions population may increase gradually, and wealth rapidly.¹

The doctrine of over-population has therefore lost its terrors for modern society. The stress has been shifted from food to wealth and efficiency.²

Professor Seligman looks to production to keep in abeyance the law of diminishing returns, and to reformed distribution to make life easier for the lower classes, and to "economic and sociological" forces to automatically check the birth rate. In this latter statement he seems to admit that the birth rate might cause pressure of population on the food supply. On the whole, however, he does not think that Malthusianism has much interest for us at present.

Dr. Pierson, after stating Malthus' doctrine as he understands it, concludes as follows: "Apart from the very last point, . . . all this appears to us to be incontrovertable".³ In general, Dr. Pierson may be said to hold to the doctrine of Malthus, although his chief emphasis is upon the relation of population and production. In this he differs from many modern economists, who look upon population and distribution as more closely associated than population and production. But Dr. Pierson holds that population does tend to increase faster than the means of production existing at any given time could provide for it, and so new means of production are necessary if population is to continue increasing at anything like its present rate.

Many other writers might be reviewed and quoted, but such a proceeding would only serve to make one more cer-

¹ Seligman, *Principles of Economics* (New York, 1914), pp. 64, 65.

² *Ibid.*, p. 66.

³ Pierson, *Principles of Economics*, translated by A. A. Wotzel (London, 1902), vol. ii, p. 128.

tain that opinion is very much divided regarding the doctrine of population. Some writers seem to believe in Malthusianism, but yet see no danger of over-population, because they think the standard of living will sufficiently curtail numbers; others believe that as long as there is suffering and a "submerged tenth," there is over-population, and would urge the moral restraints of Malthus; still others confidently expect that physiological changes will bring about a decreased rate of growth, and thus stop the working of the Malthusian principle. But it is useless to enumerate further the variations of belief regarding the doctrine of Malthus, as most of them are illustrated in the earlier parts of this chapter.

I have endeavored to refrain from criticism of the views set forth above, because, as was said at the beginning, the purpose of this chapter is to give a general idea of the present state of opinion on this question. Furthermore, I do not feel that I am ready to make criticisms at this stage of my study, and besides, the most effective criticism of other men's views is a constructive theory on the same subject. Such a theory I hope to set forth at some length in the later chapters of this study.

CHAPTER III

WAGES AND PRICES

A comparison of wages and prices in several countries will show as nothing else can how the working man is affected by the present high level of prices. Unfortunately, this comparison cannot be made in the thoroughgoing manner which would be desirable. There is not a great deal of material upon these subjects, and such as there is often does not lend itself readily to comparison. But in spite of this drawback it will be possible to make comparisons which will throw light upon the economic condition of the working classes in several countries. The index number will be used to make these comparisons because of the ease of understanding the results and the simplicity it allows in presentation.

There has been a great deal written upon the high cost of living and kindred subjects, but there has been very little effort made to ascertain definitely the relation between prices and wages, and in this way to arrive at some conclusions regarding the present condition of the working man. Often, too, the question has been discussed as though it were merely a national question. But a very hasty survey of the field shows that such is not the case. The rise in prices has been world-wide and the workmen of the world are affected by the changes which have taken place. It will be the purpose of this chapter to show as definitely as possible the relations of wages and prices within the last two decades. It is quite evident that the rise in prices is not a serious matter providing the means of paying this increased

price is increased in like or greater proportion. But the very fact that we hear so much about the high cost of living creates the presumption that a greater proportion of wages and salaries is going to provide the necessities of life than was formerly the case.

Many of the efforts at social and economic reform at the present time are also directed, not so much to raising the general standard of life as to keeping up to present standards the mode of life of the rapidly increasing populations of the great nations. This would seem to indicate a feeling on the part of social workers that wages are not increasing in proportion to the demands made upon the laborer by the increasing complexity of his life. As was suggested above, the study made in this chapter cannot tell us as definitely as we should desire what is actually the relation between wages and prices in recent years. It will, however, enable us to draw some general conclusions which will be of interest.

WAGES AND PRICES IN THE UNITED STATES

The Bureau of Labor Statistics of the Department of Labor has made some good studies of wages and prices in this country. These studies begin with the sixth and seventh annual reports, issued in 1890 and 1891. They were not of much value, however, until the publication of the eighteenth annual report on *Cost of Living and Retail Prices of Food*, in 1903. This investigation not only secured data on the cost of living, but also retail prices for 30 articles of food from 814 merchants for the years 1890-1902 and from 811 merchants for the year 1903. These merchants were scattered over 33 States.¹ The relative importance of each of these 30 articles of food was ob-

¹ Eighteenth Annual Report of the Commissioner of Labor, p. 635.

tained from the reported consumption of food in 2,567 families.¹ The index numbers were then calculated on the basis of these weighted averages. It appears, however, that weighting has very little influence on the index numbers, for the greatest difference between the simple and weighted index numbers during this period of 14 years is 0.6. For this reason the objections to this method of weighting the averages are of little moment.²

This study of retail prices was brought down to the end of 1907 in Bulletin 77 of the Bureau of Labor Statistics. The only changes in the studies introduced in this period were increases in the number of localities, states and merchants from which the data were secured.³ The data in the Bulletins up to 1907 were comparable in all respects and were supposed to give the course of retail prices in a fairly accurate manner for the years 1890-1907.

This series of studies was discontinued in 1908 and was not resumed until 1912. When they were resumed they did not have the scope of those of earlier years. They were confined to 39 important industrial cities in 32 states, and were obtained from only 650 merchants. But the most significant change of all was the restriction of the inquiry to 15 articles of food instead of continuing the prices for the original 30. These 15 articles of food represent approximately two-thirds of the expenditure for food by the average workingman's family.⁴ But it would be much more satisfactory if the data for 1908-1913 were for the same articles of food as those of the earlier studies. The two series of index numbers for the 30 articles of food and

¹ Eighteenth Annual Report of the Commissioner of Labor, p. 654.

² *Ibid.*, p. 655, also Rubinow, "The Recent Trend of Real Wages," *American Economic Review*, Dec., 1914.

³ Bureau of Labor Statistics, *Bulletin*, no. 77, pp. 181 and 200.

⁴ *Ibid.*, no. 105, pt. 1, pp. 5-7.

that for the 15 articles can be compared up to 1907, when the former ceases. This comparison shows that they do not vary much until 1899. From this time on the index number for the 15 articles rises more rapidly than that for the 30 articles. In 1907 the difference is 5.3 (125.9 and 120.6 respectively).¹ This would seem to indicate that the later retail prices were affected to a certain extent by the changes introduced in the method of securing them. But granting that this is the case, and at the same time making use of the weighted index numbers for the 15 articles of food which are somewhat lower than the unweighted index numbers, still there can be no doubt that prices have risen very rapidly since 1899. In 1899 the index number was 100.8, in 1913 it was 163.4, a rise of 62.6, which is approximately 62 per cent. This rise may be somewhat excessive, but the index numbers could be scaled downwards several points and still they would indicate a very rapid rise in the price of foodstuffs.

Studies of retail prices standing by themselves are of little value. Realizing this, the Bureau of Labor issued as its nineteenth annual report a study of *Wages and Hours of Labor*. This report covered the wages in 67 industries, 519 occupations and 3,475 establishments.² Here again the question of weighting came up, and the Bureau calculated four sets of index numbers for wages per hour.³

1. Industries weighted according to aggregate wages paid in each industry as reported by the census of 1900.

2. Simple average of all occupations.

3. Simple average of all industries.

¹ Rubinow, *loc. cit.*

² Bureau of Labor, *Nineteenth Annual Report*, p. 11, also Rubinow, *loc. cit.*

³ *Ibid.*, p. 23, also Rubinow, *loc. cit.*

4. Industries weighted according to number of employees in each industry as reported by census of 1900.

As in the case of the index numbers of retail prices, this weighting seems to make little difference in the index numbers. The difference is less than 1.0 in all years except the last (1903). In this year it was 1.7.² Index numbers were also calculated at this time for the full-time weekly earnings per employee. The work on wages begun in this report was brought up to the close of 1907 in Bulletin 77, but the number of industries studied was reduced to 41 and the number of occupations to 333. In this publication the purchasing power of wages in terms of foodstuffs was also calculated. These index numbers of the purchasing power of wages showed that real wages were higher in 1907 than the average for the ten-year period 1890-99.¹ When this curve is smoothed by the use of five-year averages it appears that there was a slight fall in the purchasing power of wages from 1900 to 1907, although this fall was not continuous, the index numbers for the years 1903-7 being practically the same.²

After Bulletin 77, which was issued in July, 1908, no more studies of wages were issued until 1913. Some very detailed studies have since been published, but unfortunately they are not a direct continuation of the earlier studies. The earlier studies covered the data in 41 industries, as mentioned above, the later ones had covered only 16 of the same industries in June, 1914. The earlier wage data were taken from the payrolls of the employers of both union and non-union labor, while the later data were taken from the union scales of wages and hours. The number of occupations in the various industries was also different in the

¹ Bureau of Labor, *Bulletin*, no. 77, p. 7.

² Rubinow, *loc. cit.*

two series of studies. These differences make a comparison of the two series difficult but not impossible, for, as Rubinow points out, there are data in the later series on 16 industries covering 241 occupations, of which 141 are identical with those of the earlier series. In most of these cases, however, the Bureau has made no effort to compute the index numbers of wages for the years 1908-13 on the basis of the ten-year average 1890-99 as was done in the earlier studies, nor has it attempted to measure wages in terms of prices in this later series. It is evident, however, that if the data on wages obtained from the two series are at all comparable, a computation of wages in terms of prices can be made, for we saw above that a fairly accurate series of index numbers for prices was available for the years 1890-1912. Rubinow has checked up the actual wage data as given in the two series of studies for the year 1907, and he believes that the facts are really continuous as far as they go, even though they were not collected in the same manner.¹ My own checking-up of data for 1907 from the two series of studies confirms Rubinow's conclusion in this respect. A continuous series of index numbers for wages for 16 industries, including 141 occupations, can therefore be made for the years 1890-1912. To do this, however, it is necessary to calculate the weekly wages from the wages per hour and the hours per week, as this has not been done in most of the Bulletins. Rubinow has done this. The results are given in Table I.

The chief objections which may be made to drawing any reliable conclusions from Table I are:

1. That the index numbers for prices of articles of food are not representative of prices for all articles consumed by the workingman's family, and that therefore to measure

¹ *Supra*, p. 39, also Rubinow, *loc. cit.*

wages by prices of articles of food does not give a correct idea of the relation of prices and wages. Rubinow points out that the investigation of the Bureau of Labor in 1903 showed that slightly over 43 per cent of the total expenditures of the workingman's family was for food, and that five years later Chapin's study of *The Standard of Living in New York City* showed the same percentage of the income spent for food (43.5 per cent). This indicates that other articles for which the laborer was spending his income must have risen in price to approximately the same degree as foodstuffs, for otherwise we would find a greater proportion of the income being spent for food in the later study.

2. That the index numbers for prices are not strictly comparable for the period of 23 years, because of the changes introduced in the methods of collecting and tabulating the data. It was shown above, however, that the degree of probable error is not so great but that we are justified in drawing some general conclusions from the index numbers based upon them.

3. That the wage data are drawn from different sources—employers' payrolls and union scales—and therefore do not give us a series comparable throughout. This objection has been answered above.

4. That average wages will not tell us the real condition of industrial workers. It is true that average wages will not tell us the exact conditions of a particular industry about which we should like to know details. But the average wages paid in a given industry for a period of years should tell us whether wages, as a whole, are rising or falling in this industry. This should also be true of the average wages for a number of industries for a period of years. The following table is taken from Rubinow's article:

TABLE I.—COMPUTATION OF INDEX OF REAL WAGES, 1890-1912.

Year.	Hours per week.	Wages per hour.	Full time weekly earnings per employee.	Retail prices of food.	Purchasing power measured by retail prices of food.	
					Hourly wages.	Weekly earnings.
1890	101.1	100.2	101.3	101.9	98.3	99.4
1891	100.9	99.9	100.8	103.4	96.6	97.5
1892	100.7	100.3	101.0	101.6	98.7	99.4
1893	100.4	101.2	101.6	104.1	97.2	97.6
1894	99.2	98.9	98.1	99.2	99.7	98.9
1895	99.8	98.6	99.2	97.1	101.5	102.2
1896	99.7	100.0	99.7	95.2	105.0	104.7
1897	99.5	99.6	99.1	96.7	103.0	102.5
1898	99.6	100.2	99.8	99.7	100.5	100.1
1899	99.2	101.4	100.6	100.8	100.6	99.8
1900	98.6	104.7	103.2	103.0	101.6	100.2
1901	98.1	107.0	105.0	108.5	98.6	96.8
1902	97.4	112.0	109.1	114.6	97.7	94.3
1903	96.7	115.5	111.7	114.7	100.7	97.3
1904	96.0	116.3	111.6	116.2	100.0	96.0
1905	96.0	119.6	114.8	116.4	102.8	98.6
1906	95.4	123.6	117.9	120.3	102.7	98.0
1907	95.1	129.3	123.0	125.9	102.7	97.7
1908	94.5	128.5	121.4	130.1	98.8	93.0
1909	94.4	129.9	122.6	137.2	94.7	89.4
1910	93.8	134.0	125.7	144.1	93.0	87.2
1911	93.3	136.3	127.2	143.0	95.3	88.9
1912	93.0	141.5	131.6	154.2	91.8	85.3

Regarding this table, Rubinow says:

In brief, the salient features of the results of the economic development during the last five years, as they appear in the preceding table, may be summarized thus, as far as the figures combined and computed here may be relied upon:

(1) From 1907 to 1912, the wages per hour rose from 129.3 to 141.5, 12.2 points on the recognized scale or 9.4 per cent.

(2) During the same time the hours of labor declined from 95.1 to 93.0, 2.1 points or 2.2 per cent.

(3) The weekly earnings increased from 123.0 to 131.6, only 8.6 points or 7 per cent.

(4) The retail prices of food increased from 125.9 to 154.2, 28.3 points or 22.5 per cent.

(5) The purchasing power of an hour's wages (as expressed in cost of food) decreased from 102.7 to 91.8, 10.9 points or 10.6 per cent.

(6) The purchasing power of weekly wages, or the true weekly wages, have decreased still faster, from 97.7 to 85.3, 12.4 points or 12.7 per cent.

As Rubinow is very careful to point out, these conclusions must not be accepted as absolutely accurate. The chief limitations upon them have been pointed out above. The conclusion, which does seem to be fully justified, is that within the last few years real wages have actually fallen. If this is the case, then the American workingman is finding it increasingly difficult to keep up his standard of living.

WAGES AND PRICES IN THE UNITED KINGDOM

The Board of Trade for the United Kingdom has compiled a series of index numbers of wages and prices. The series of wholesale prices extends over a longer period than that of retail prices, which begins in 1895. The wage statistics also extend over a longer period than the retail prices. The index numbers from 1890 to 1912, as far as they are available, will be given here. Table II summarizes the data for this comparison.

It will be seen from a study of this table that what was true of the United States is true in less degree of the United Kingdom. It must be borne in mind that a different base is used for the two sets of index numbers, and therefore they cannot be compared. The comparison of nation with nation is relatively unimportant, inasmuch as there are so many factors complicating this situation that it is impossible to draw any conclusions from such a comparison.

TABLE II:—RELATIVE WAGES AND PRICES IN THE UNITED KINGDOM

(The year 1900 equals 100.0 in all cases)

Year	Wholesale prices of ¹ forty-five commodities General	prices of ¹ twenty-one articles of food	Retail ¹ prices of food	Wages ² Five industries ³	Four industries ⁴	Hooker's index number of wages ⁵
1890	104.0	109.5		90.26	90.08	90.2
1891	107.4	117.0		91.54	91.13	91.4
1892	101.8	110.9		90.06	89.27	89.9
1893	100.0	109.7		90.13	89.50	90.0
1894	94.2	102.9		89.49	88.69	89.4
1895	91.0	99.5	93.2	89.11	88.23	89.1
1896	88.2	93.3	92.0	89.92	89.24	89.8
1897	90.1	97.4	96.2	90.80	90.05	90.8
1898	93.2	102.3	100.8	93.20	92.64	93.1
1899	92.3	98.1	96.4	95.37	95.06	95.3
1900	100.0	100.0	100.0	100.00	100.00	100.0
1901	96.9	100.4	101.9	99.07	98.56	99.0
1902	96.5	101.7	101.6	97.78	96.96	97.8
1903	96.9	100.7	103.2	97.20	96.21	97.1
1904	98.3	101.4	104.3	96.67	95.56	96.7
1905	97.6	101.2	103.7	97.03	95.94	96.9
1906	100.4	100.5	103.2	98.42	97.60	98.3
1907	105.7	105.1	105.8	101.77	101.79	101.6
1908	102.8	106.6	108.4	101.23	100.97	101.0
1909	104.0	108.7	108.2	99.98	99.41	100.0
1910	108.8	109.1	109.9	100.21	99.70	100.1
1911	109.3		109.3			
1912	115.0		114.9			

¹ The wholesale and retail prices are compiled from the *Report to Parliament on Wholesale and Retail Prices* and from later information received in the department of labor. No study of retail prices was made prior to 1895.

² *Fourteenth Abstract of Labor Statistics of the United Kingdom*, p. 68.

³ These five industries are building, coal mining, engineering, textile and agriculture.

⁴ These are the same as the five above except that agriculture is omitted.

⁵ Hooker, R. H., "The Course of Prices at Home and Abroad." *Journal of the Royal Statistical Society*, Dec., 1911. The base has been changed in order to make Hooker's index numbers comparable with those of the Board of Trade.

Here, too, we find that wages are not keeping pace with prices, especially since 1900. Wages from 1907-1912 were almost exactly what they were in 1900, while foodstuffs, whether we consider wholesale or retail prices, have advanced about 9 per cent. Mr. Hooker¹ does not consider the wage statistics of the Board of Trade as representative as those of the Bureau of Labor prior to 1907. But they include data regarding the wage-workers in five great industries, and so represent with more or less accuracy the general course of wages. If we express the wages in terms of retail prices we get the results in columns 1 and 2 of Table III. Here we find that the purchasing power of wages in terms of food has fallen about 9 per cent since 1900. The difference of purchasing power of wages in the four-industry group and the five-industry group is negligible, although it is generally a little higher in the five-industry group. This is of greater significance when we consider that the wage-workers in the four-industry group are better able to organize and demand increased wages than the agricultural laborers who are included in the five-industry group. The years 1905-6-7 show a rise in purchasing power, while following the depression of 1907 we find that the purchasing power of wages has fallen. The trend of real wages in England runs parallel with that of the United States.

Unfortunately, the Board of Trade has not yet published the index numbers for wages, which would enable us to see just how wages have changed in 1911 and 1912. The result is that we cannot tell just how much the rise in prices has exceeded the rise in wages, but that it has done so there is little reason to doubt. In speaking of the rise of wages in 1911 and 1912, the *Labour Gazette* says: "The upward

¹ *Jour. of the Roy. Stat. Soc., loc. cit.*

TABLE III.—THE RELATIVE PURCHASING POWER OF WAGES ¹ IN THE UNITED KINGDOM

(The year 1900 equals 100.0 in all cases)

Year	Purchasing power of wages in terms of retail prices using Board of Trade figures throughout		Purchasing power of wages in five industries in terms of the wholesale prices of twenty-one articles of food
	Five industries	Four industries	
1890			82.4
1891			78.2
1892			81.2
1893			82.1
1894	2	2	86.9
1895	95.6	94.6	88.5
1896	97.7	97.0	96.3
1897	94.3	93.6	93.2
1898	92.4	91.9	91.1
1899	98.9	98.6	97.2
1900	100.0	100.0	100.0
1901	97.2	96.7	98.6
1902	96.2	95.4	96.1
1903	94.1	93.2	96.5
1904	92.6	91.7	95.3
1905	93.5	92.5	95.8
1906	95.3	94.5	97.9
1907	96.1	96.2	96.8
1908	93.3	93.1	94.9
1909	92.4	91.8	91.9
1910	91.1	90.7	91.8

movement in wages, which was not very marked in 1911—except in the case of railwaymen, seamen, and other transportation workers—continued to be only slight in the first three months of 1912, but became more pronounced in the period April-December.” ³ The strike of the coal miners is accountable for the greater part of the actual increase.

¹ These are calculated by dividing the index number for wages of the given year by the index number for prices in the same year.

² No study of retail prices was made by the Board of Trade prior to 1895.

³ Board of Trade, *Labour Gazette*, Jan., 1913, p. 3.

We may reasonably conclude, then, that wages in the United Kingdom are not advancing as rapidly as prices. The laborer is not able to offset the higher price he pays for commodities by a larger wage. He is rather forced to contract the amount of his purchases. It must be borne in mind, too, that in the United Kingdom, as in the United States, the wage statistics available for the most complete comparison relate to the trades unions. It is a perfectly legitimate conclusion, then, that the condition of the wage-worker in the United Kingdom has not been growing better since 1900.

WAGES AND PRICES IN FRANCE

For France we do not have as good data as for the United States and the United Kingdom. But data gathered from different sources are consistent in showing that the rise of wages in France has kept ahead of the rise in prices of foodstuffs (see Table IV). This is true both for retail and wholesale prices. The course of wages in France does not show the fluctuations which we find in the United States and the United Kingdom. The French workingman seems to have been able to command a steady advance in wages which would enable him to raise his standard of living. The course of wages indicated by the inquiry into *Salaires et Coût de L'Existence* (column 4) is probably more accurate than that which I have worked out, because it is more representative of industry in general. The mining industry as a whole is the predominant factor in the latter, and it is quite likely that the organization of these men would enable them to keep their wages somewhat ahead of the general level.

But it is worthy of note that most of the rise in prices which has taken place since 1890 has taken place since 1907, and since that time wages have not risen as rapidly as

TABLE IV.—RELATIVE WAGES AND PRICES IN FRANCE

(1890 = 100.0)

Year	Retail prices of food March ¹	Normal ²	Wholesale prices of food ²	Wages Salaires et coût de l'existence ³	Thompson ⁴
1890	100.0	100.0	100.0	100.0	100.0
1891	103.1	103.9	94.0	100.0	100.9
1892	103.1	102.9	89.7	100.0	102.6
1893	104.7	97.0	87.1	100.0	100.6
1894	98.7	102.9	83.7	100.0	99.3
1895	91.8	100.9	80.3	104.2	102.9
1896	85.2	98.0	80.3	104.2	103.8
1897	88.7	95.0	83.7	104.2	105.4
1898	92.5	100.0	84.6	104.2	105.7
1899	89.6	101.9	83.7	104.2	107.5
1900	90.5	97.0	87.1	108.5	111.2
1901	91.6	97.0	91.4	108.5	113.0
1902	89.6	99.0	91.4	108.5	111.6
1903	90.5	100.9	90.5	108.5	112.2
1904	90.0	100.9	84.6	108.5	113.0
1905	97.1	105.9	87.1	113.8	114.4
1906	94.3	105.9	93.1	113.8	116.0
1907	99.2	110.9	98.2	113.8	122.0
1908	104.4	112.8	104.2	113.8	126.9
1909	105.4	107.9	104.2	113.8	128.1
1910	109.9	112.8	104.2	117.0	130.6

¹ March, M. Lucien, *Bull. de l'institut inter. de stat.*, vol. xix, pt. iii, pp. 222-3.

² Quoted by Hooker, *loc. cit.*, from the recent French inquiry into *Salaires et coût de l'existence*. The index numbers are given as averages for five year periods from 1890-1910 and in order to fill up the table I have given the same number for five consecutive years.

³ Hooker, *Jour. of Roy. Stat. Soc.*, *loc. cit.*

⁴ This series of index numbers was obtained by working out an index number for each of five industries from the average wages given for them in the *Abstract of Foreign Labor Statistics* issued by the Board of Trade and then combining these into a compound unweighted index number. The five industries are, coal mining both surface and underground, iron mining surface and underground and beet sugar. The wages for the years 1908-10 were taken directly from *Statistique de l'industrie minérale en France*, 1911. About 215,000 men are employed in these industries.

prices. It is due to the continuous rise in wages from 1890 until 1907 that the French laborer is not in the same position as the English and American laborer. But in spite of this the French laborer is feeling the increased pressure, as the inquiry into the cost of living shows. If we express wages in terms of the "normal" retail price (making 1890 equal to 100.0), we find that a maximum purchasing power was reached in 1900 and 1901, when it was 111.8. Then it gradually fell until it was only 100.8 in 1908. It rose a little in 1909 and fell to 103.7 in 1910, which is several points below what it was previous to 1907. This would seem to indicate that within the last five or six years real wages have been falling slightly in France, although not so rapidly as in England and America.

PRICES IN OTHER COUNTRIES

Below will be found index numbers for prices in several other countries. These index numbers show that in most cases prices have risen quite rapidly since 1900, and are higher at the latest date at which they are available than in 1907 (the exceptions to this statement are Schmitz's wholesale prices for Germany and the index number for Japan for 1909). Although index numbers for wages in these countries are not given here, it is well worth noting that prices have been rising steadily since 1907, while it is a generally recognized fact that business has been rather dull in most of the great industrial countries since that time. Is it not worth considering whether the situation presumably existing in each of those countries for which wages are given is not also existing in these other countries for which index numbers for wages have not been given? The only certain conclusion to be drawn from these data, however, is that prices have been steadily rising throughout the civilized world since 1900, and one may add that real wages

have been falling somewhat at least since 1907, and probably since 1900, in those countries for which data are given.

TABLE V.—RELATIVE PRICES IN GERMANY

(The year 1895 equals 100.0)¹

Year	Wholesale ² Hooker	Retail ² Board of Trade	Wholesale ³ Schmitz	Retail ⁴ Bavaria
1895	100.0	100.0	100.0	100.0
1896	93.6	97.9	100.4	98.3
1897	98.9	101.0	102.6	99.8
1898	108.5	103.0	108.5	103.7
1899	106.3	101.0	117.8	101.9
1900	108.5	102.0	127.4	101.3
1901	109.5	103.0	119.8	101.8
1902	107.4	105.1	118.5	104.6
1903	114.9	104.1	120.5	104.3
1904	114.9	103.0	119.8	105.7
1905	120.2	110.2	123.9	112.1
1906	122.3	116.3	134.1	116.2
1907	128.7	118.3	143.0	115.2
1908	120.2	121.4	135.1	117.3
1909	132.9	122.4	133.5	122.9
1910	136.1		136.0	127.3

¹ These index numbers all have different bases in the sources from which they are taken but have been reduced to a common base for purposes of comparison.

² Hooker, *loc. cit.* These numbers refer to prices of food-stuffs only.

³ *Ibid.* These numbers refer to all commodities.

⁴ This series of numbers was computed by Dr. Fr. Zahn, Director of the Bavarian Statistical Office, *Bull. de l'institut inter. de stat.*, vol. xix, pt. iii, pp. 126-31. These numbers are computed on the basis of the percentage which each of 19 articles of food formed of the total expenditure for food in the lower middle class families of Germany.

TABLE VI.—RELATIVE PRICES OF FOODSTUFFS IN VARIOUS COUNTRIES ¹

(The year 1900 is used as the base in all cases)

Year	Austria ² Hungary	Netherlands ³	Dominion of Canada ⁴	Japan ⁵
1890	105.1		107.6	56.4
1891	110.2		107.4	53.1
1892	102.5		100.2	53.1
1893	101.2	102.0	102.7	54.3
1894	100.0	98.9	94.9	59.2
1895	102.5	100.0	93.7	62.5
1896	97.4	95.9	86.9	70.0
1897	100.0	97.9	86.5	87.7
1898	106.4	98.9	93.9	100.0
1899	100.0	98.9	96.5	90.4
1900	100.0	100.0	100.0	100.0
1901	100.0	101.0	103.5	101.3
1902	103.8	101.0	107.5	102.0
1903	107.7	102.0	106.7	111.5
1904	112.8	103.0	107.8	117.0
1905	121.8	101.0	110.3	119.0
1906	120.5	102.0	115.0	122.4
1907	125.6	105.1	125.7	128.5
1908	128.2	109.2	125.2	130.6
1909	137.1	110.2	130.7	122.4
1910		115.3		
1911		117.3		

¹ These index numbers are all taken from the *Bull. de l'institut international de stat.*, vol. xix, pt. iii. The base is changed in every case in order to make them more comparable.

² By Dr. Béla Von Jankovich, vice-president of the Hungarian House of Representatives. They are a combination of wholesale and retail prices of 19 articles of food.

³ By H. W. Methorst, Director of the Central Bureau of Statistics of the Netherlands. These numbers are based upon 29 articles of retail trade all but three of which are articles of food. No prices are given prior to 1893.

⁴ By R. H. Coates, associate editor of the *Labour Gazette*. These are wholesale prices.

⁵ By M. N. Hanabusa, Director of the Bureau of General Statistics. These numbers are based on wholesale prices and are for the 4 chief articles of food: rice, barley, legumes and saké.

CHAPTER IV

CEREAL, PULSE AND ROOT CROPS

THE aim of this chapter is to determine as accurately as possible the rate of increase of the cereal, pulse and root crops which form the staples of diet of the peoples of the western world. The effort has been, therefore, to take account of these crops in those countries which contribute to the food supply of the western world. It has been impossible, however, to take into account all of these countries because of the total lack of data relating to some of them, but those countries of greatest importance to the inquiry have data which are more or less reliable.

In regard to the tables which follow, it is necessary to make some general explanations. The form in which they appear would give the impression that the data from which they were compiled relate to the exact year which heads the column in which they are found. But in some cases the data which are given under a definite year., *e. g.* 1890, really relate to the years 1888, 1889, 1891 or 1892. This has not been indicated in specific cases, because the purpose of these tables is not to give the accurate statistics for a given year, but to ascertain the trend of production for each country considered. For this reason, also, if the production for any given year either fell much below or rose much above that of the years immediately preceding or immediately following, the figures have been altered so that the result would indicate the average yield for a period of years. In a few cases where data were lacking for a given period, but

were available on both sides of this period, the data for the year in question have been estimated on the basis of the trend indicated by the data at hand. In examining these tables, therefore, and comparing them with official data, some inaccuracies will be found. But, as said above, I am aware of these inaccuracies, and in most cases have purposely introduced them in order to have the result show the tendency towards increase or decrease which is taking place. For this reason I feel, after a careful comparison of these tables with the official statistics which are before me, that these tables are much more indicative of the changes which are taking place in the production of these articles of food than the more accurate statistics of the given years. But, after all, the number of changes which have been made is not large, and consists chiefly of a slight shifting backward or forward of data so as to make the number of points (in time) at which they are taken few enough to be handled easily, while keeping enough of them to enable comparisons of value to be made. To indicate in this place every inaccuracy of this sort has been deemed unnecessary, inasmuch as a detailed explanation of all changes will be found in Appendix A.

A statement of sources will be in place here in order to make unnecessary many specific references. The data for the United States are taken from the census reports and from the reports of the Department of Agriculture. The data for all the other countries are taken from the statistical abstracts of Great Britain, these three series being used: (1) *Statistical Abstract for the United Kingdom*, (2) *Statistical Abstract for the Principal and Other Foreign Countries*, (3) *Statistical Abstract for the Colonies and Self-Governing Possessions of the British Empire*. These Abstracts are compiled from the official sources of the various countries to which they relate, and render available

many data which would otherwise be closed to one who reads but a few languages.

In looking over these tables it will be noticed that the data for some of the countries do not begin before 1900, and that those for some of the other countries do not commence with 1870 or 1860, as may be the case with most of the figures in that table. In making use of the percentages in the totals it must be borne in mind that the addition of the data in a given year for certain of these countries has a material effect in increasing the percentage gains recorded. Another factor which enters in to make the percentage increase larger than it should be is the fact that the returns are more complete year by year.

It should be noted, too, that most of the substantial gains in production have been made in the countries where new land has been easily available for cultivation. The older of the European countries do not show any very substantial gains, and in many cases there are losses in amount produced as well as in the number of acres under the given crops. The production per acre does not seem to increase so rapidly as one might suppose would be the case (see Table VIII, Appendix C). A very casual inspection of the tables will convince anyone that no epoch-making discoveries for increasing the yield per acre have been made within the period covered by these tables. Those who are very sanguine about the great increase in acreage production which the future will bring forth, can find little comfort in the tale told in these tables. The real gains have been made in bringing more acres under cultivation. No nation, however small, shows any large and consistent gain in the acreage production of the staple crops of cereals. This is not to say that some land is not producing better crops than formerly, but it is to say that at present the better methods of cultivation and fertilization are almost entirely offset by

the bringing into cultivation of poorer grades of land which yield returns only because of the economies due to modern machinery.

The total production of cereal crops as given in the following tables is:

	Cwts.	Percentage increase.
1910	6,817,998,000	26.1
1900	5,402,645,000	21.5
1890	4,443,897,000	30.5
1880	3,404,065,000	42.6
1870	2,385,829,000	

These tables are given as the best data available on the production of these crops. I am conscious of the limitations to their exactness. Some of these limitations I have already pointed out, others will occur to the reader at once and are so obvious that they need not be mentioned here. The tables and their limitations will be discussed more fully in a later chapter, when the crops are studied in connection with other data.

The full tables of acreage and production, with the percentages of increase or decrease, will be found in Appendix C. Only the percentages of increase or decrease in the production of cereals, pulse and potatoes for the chief countries of the western world will be given in the text.

TABLE VII.—PERCENTAGE OF INCREASE OR DECREASE IN THE PRODUCTION OF CEREALS PULSE AND POTATOES.

Country	1860-1910.					
	1910	1900	1890	1880	1870	1860
United States—						
Wheat	3.8	40.6	1.9	59.6	66.2	
Maize	22.8	—1.6	37.4	58.5		
Oats	26.5	5.9	20.4	128.6		
Barley	136.3	—6.3	94.4	53.2		
Rye and spelt	23.2	—15.6	16.1	33.9		
Pulse	53.5	27.8	3.2	18.7		
Potatoes	44.8	21.1	28.8			

TABLE VII.—PERCENTAGE OF INCREASE OR DECREASE IN THE PRODUCTION OF CEREALS PULSE AND POTATOES.—*Continued*

Country	1860-1910					
	1910	1900	1890	1880	1870	1860
United Kingdom—						
Wheat	4.1	—28.5				
Maize						
Oats	6.4	—3.5	—0.8	1.6		
Barley	—8.0	—15.1				
Rye and spelt						
Pulse	10.3	—36.5	—14.8	—21.4		
Potatoes	15.0	—1.6	2.9	3.5		
Russia in Europe—						
Wheat	106.3	27.3	38.4	5.1		
Maize	13.1	150.7	26.1			
Oats	21.4	21.2	8.7	—4.2		
Barley	120.5	0.6	46.3	—3.3		
Rye and spelt	—5.8	9.7	28.5	1.4		
Pulse	39.1	43.2	—36.9	—12.4		
Potatoes	93.2	48.4	23.5	17.7		
Germany—						
Wheat	0.5	35.6	20.7			
Maize						
Oats	11.4	44.3	16.2			
Barley	—3.3	31.4	6.4			
Rye and spelt	20.8	41.7	16.8			
Pulse						
Potatoes	23.4	15.8	72.1			
France—						
Wheat	4.7	—1.8	16.2	19.9		
Maize	—8.7	—16.0	—19.5	7.5		
Oats	16.0	5.6	10.2	25.1		
Barley	6.4	—16.1	—10.7	2.6		
Rye and spelt	—11.7	—13.5	—8.4	27.0		
Pulse	12.7	—4.5	—1.5	—0.7		
Potatoes	118.4	7.5	10.8	45.6		
Italy—						
Wheat	3.1	1.1	—8.9	1.7		
Maize	28.8	—5.9	—15.6	—0.7		
Oats	32.9	0.9	—0.2	—4.7		
Barley	13.8	—32.1	—40.4	—3.8		
Rye and spelt	21.1	—9.7				
Pulse	56.5	—17.3	—23.8	2.5		
Potatoes	8.5	—6.5	6.6	15.5		

TABLE VII.—PERCENTAGE OF INCREASE OR DECREASE IN THE PRODUCTION OF CEREALS PULSE AND POTATOES.—*Concluded*

Country	1860-1910				
	1910	1900	1890	1880	1870
Austria—					
Wheat	39.3	—5.0	8.5	—1.7	
Maize	23.2	—19.5	13.5	5.7	
Oats	20.4	0.8	12.3	16.4	
Barley	—7.2	28.5	7.7	2.0	
Rye and spelt	99.0	—30.1	25.8	—20.2	
Pulse	—6.6	14.7	—11.8	15.6	
Potatoes	35.6	16.7	42.6	17.0	
Hungary—					
Wheat	6.0	3.2	86.6	62.2	
Maize	29.7	53.9	—7.8	22.5	
Oats	—5.5	32.6	—13.5	177.7	
Barley	—8.1	2.4	3.9	6.5	
Rye and spelt	7.6	—14.4	45.4		
Pulse	67.4	152.5	49.2	13.3	
Potatoes	51.0	82.1	40.1	164.3	

CHAPTER V

ANIMALS ON FARMS

THE sources of the statistics in this chapter are the same as those of the tables in the preceding chapter and need not be repeated here.¹ There is reason to believe that statistics on number of animals are a little more accurate than those on production. Of course, there are errors, but those of much moment are obvious, such as the increase of cattle in India, 1900-1910, which is probably due for the most part to more complete returns, and those for Chile, which suggest that the earlier enumeration was too high. But the errors are quite likely to be compensating, so that the results will be fairly accurate. Just a word about those for the United States. Inasmuch as the last census enumeration was made at a different time of year than the former enumerations, it was necessary to exclude the number of calves from the number of cattle, but this has been done for all the years, and therefore the figures given here are comparable.

The fact that only animals kept on farms are included in the returns of most countries brings it about that some animals kept in towns are omitted. But since this number is not large (except in the case of horses) and is decreasing in most civilized countries, it is not likely that the results are much affected. If the results are affected in any ap-

¹ Detailed explanation of changes in date and number in the tables of this chapter will be found in Appendix A.

preciable degree, the tendency would be to raise the percentages found on the farms in recent years.

It should be noted that the total numbers and percentages of cattle for the years 1910, 1900 and 1890 are raised greatly by the numbers of cattle in India. It is scarcely probable that the percentages of increase of cattle in India are as great as given here. Besides, the cattle of India are not yet a factor in the meat supply of the outside world. For we do not find cattle or meat among the exports of foodstuffs from India. If we subtract the increase due to India alone from the total increase of cattle between 1900 and 1910, we find that the percentage of increase is reduced from 15.0 to 4.5, which much more nearly represents the increase in the available supply of cattle than does the 15.0 per cent. Thus, in spite of the advent of a number of countries to the ranks of the meat-producers of the western world in the last thirty years, we find that at present the available supply of meat, as represented by the number of cattle raised, is increasing but slowly. Countries such as Canada, Russia in Asia, New Zealand, Australia, and Argentina are now increasing their numbers of cattle rapidly. They seem to be at the stage of development where the United States was thirty or forty years ago. There are large areas of grass lands, on which cattle live and multiply without much attention and care from man. As these countries become more settled and agriculture claims the land, we may expect to see the number of cattle remain almost stationary, as has been the case in the United States for the last twenty years, or it may even decrease as in Russia in Europe in the last ten years.

There can be little doubt that at present the farmers are finding it more profitable to raise grain and sell it than to raise cattle. The price of all kinds of cereals has been at a high level in recent years, and has encouraged a vast ex-

tension of its cultivation, as we saw in the preceding chapter, and this extension of the cultivation of grain has crowded out the cattle. The index numbers for prices of beef in 1910, in the various countries for which they are available, show from 25 to 60 per cent increase on the base 1890-99 (France being the only important exception), and most of this has taken place since 1900.¹ And still cattle are not raised in sufficient numbers to satisfy the growing demand for meat in any of the great industrial nations. Almost daily one sees notices of shipments of meat from Canada, Australia or Argentina to the United States and the industrial countries of Europe.

If we examine the increase of sheep, as shown in this table, we find that some of the more undeveloped countries show substantial gains in numbers for all the periods for which we have data. But when we turn to the more developed countries, and especially those given to industry, we find only small gains, and in many cases actual decreases. Russia in Europe, which has made remarkable progress in the production of cereals in recent years, has had a large decrease in number of sheep, much larger than in cattle. The total percentage increase of sheep according to this table is 4.2 per cent, which is almost exactly that of cattle after we subtracted the gain credited to India between 1900-1910. There can be no doubt that the same argument applies to the growth of sheep as to that of cattle. In new countries where there is an abundance of pasturage, sheep thrive and increase rapidly in numbers, but when a nation needs the land for grain, sheep must go as cattle must go. This is a consequence we would be led to expect from a knowledge of the conditions under which cattle and sheep thrive. The statistics in this table support this conclusion.

¹ Hooker, *Jour. of the Roy. Stat. Soc.*, *loc. cit.*

A study of them in connection with those in chapter four shows that in those countries where there has been a great development in number of acres under cereals, there has been either a slow growth in numbers of cattle and sheep or even a decrease.

As said above, we would naturally expect this to be the case with cattle and sheep, but would we expect that swine, whose conditions of living are so different from those of cattle and sheep, would show a very slow rate of increase? One might possibly argue that the decrease in numbers of cattle and sheep was only a temporary phenomenon, due to the disturbance in the natural conditions of their growth and only indicated a lack of adjustment for the time being, although the situation in the older countries does not warrant such a view. But even this argument would not apply to the case of swine. They never grew wild in very great numbers nor grew to great numbers, with little care from man, on the vast open prairies. Swine need care and food furnished them, and we might expect that the great increase in cereals which we saw was taking place would lead to a raising of more swine. But Table VIII shows that swine have not increased as rapidly as either sheep or cattle in the period 1900-1910. If we glance at the index numbers for prices of pork, we see that it has increased, up to 1910, 25 to 97 per cent on the base of 1890-99. Most of this increase has taken place since 1900. France again is an exception, although the price of pork has increased there faster than the price of beef.¹

There can be but one conclusion regarding the increase in numbers of animals furnishing the meat supply of the western world. This conclusion is that the rate of increase is slow and that as compared with the rate of increase of

¹ Hooker, *loc. cit.*

grains it is much slower than one would have been led to expect. The conclusion that some of the increase in agricultural products which has hitherto gone to feed cattle, sheep and swine is now going directly to feed men, seems almost inevitable. This will be discussed more fully, however, in a later chapter, in connection with the growth of population.

TABLE VIII.—ANIMALS ON FARMS, 1860-1910

(Expressed in thousands)

Country	1910	1900	1890	1880	1870	1860
United States—						
Cattle	53,997	52,404	51,364	35,926	23,821	25,620
% increase	3.0	2.0	43.0	50.8	—10.9	44.1
Sheep	39,644	39,853	35,935	35,192	28,478	22,471
% increase	—0.5	10.9	2.1	23.6	26.7	3.4
Swine	58,186	62,853	57,410	47,682	25,135	33,513
% increase	—7.4	9.5	20.4	89.7	—25.0	10.4
Horses	19,220	16,952	15,266	10,357	7,145	6,249
% increase	13.4	11.0	47.4	44.9	14.3	
United Kingdom—						
Cattle	11,765	11,455	10,790	9,871	9,235	
% increase	2.7	6.1	9.3	6.8		
Sheep	31,165	31,055	31,667	30,240	32,787	
% increase	0.3	—1.9	4.7	—7.7		
Swine	3,561	3,664	4,362	2,863	3,651	
% increase	—2.8	—16.0	52.3	—21.5		
Horses	2,095	2,000	1,965	1,930	1,750	
% increase	—4.7	1.7	1.8	10.2		
Canada—						
Cattle	6,521	5,609	4,100	2,820		
% increase	16.2	36.8	45.3			
Sheep	2,659	2,588	3,296	3,084		
% increase	2.7	—21.4	6.8			
Swine	3,105	2,392	1,801	1,225		
% increase	29.8	32.8	47.0			
Horses	2,340	1,586	1,365	1,064		
% increase	47.5	16.1	28.2			

TABLE VIII.—ANIMALS ON FARMS, 1860-1910—*Continued*

(Expressed in thousands)

Country	1910	1900	1890	1880	1870	1860
New Zealand—						
Cattle	1,773	1,257	853	699	437	
% increase	41.0	47.3	22.0	59.9		
Sheep	22,499	19,355	16,196	12,985	9,701	
% increase	16.2	19.5	24.7	33.8		
Swine	245	250	278	200	151	
% increase	2.0	10.0	39.0	32.4		
Horses	363	266	187	162	81	
% increase	36.4	42.4	15.4	100.0		
India—						
Cattle	119,379	86,218	73,258			
% increase	38.4	17.6				
Sheep	23,325	17,855	17,070			
% increase	30.6	4.5				
Swine	No data					
Horses	1,553	1,339	1,078			
% increase	15.9	24.2				
Australia—						
Cattle	11,744	8,471	11,799	10,118		
% increase	38.6	—28.2	16.6			
Sheep	92,047	72,029	99,857	97,881		
% increase	27.7	—27.6	2.0			
Swine	1,026	947	803	891		
% increase	8.3	17.9	—9.8			
Horses	2,116	1,625	1,639	1,522		
% increase	30.2	—0.8	7.6			
Russia in Europe—						
Cattle	33,585	35,917	27,622	23,845	21,409	
% increase	—6.4	30.0	15.8	11.3		
Sheep	39,616	52,191	48,220	48,884	46,477	
% increase	—24.0	8.2	—1.3	5.1		
Swine	10,818	12,629	10,742	9,208	9,051	
% increase	—14.3	17.5	16.6	1.7		
Horses	22,307	21,076	20,867	20,016	15,611	
% increase	5.8	1.0	4.3	28.2		

TABLE VIII.—ANIMALS ON FARMS, 1860-1910—*Continued*

(Expressed in thousands)

Country	1910	1900	1890	1880	1870	1860
Russia in Asia—						
Cattle	10,685	7,670				
% increase	39.3					
Sheep	22,351	18,459				
% increase	21.0					
Swine	1,948	1,295				
% increase	50.4					
Horses	7,947	4,886				
% increase	62.6					
Norway—						
Cattle	1,094	950	1,006	1,017	953	950
% increase	15.1	—5.6	—1.0	6.7	0.2	
Sheep	1,690	1,213	1,690	2,008	1,996	1,953
% increase	39.3	—28.2	—15.8	0.5	2.0	
Swine	319	165	121	101	96	113
% increase	93.3	36.6	19.8	5.2	15.1	
Horses	172	173	151	152	149	154
% increase	—0.6	14.5	—0.6	2.0	—2.9	
Sweden—						
Cattle	2,748	2,583	2,399	2,228	1,966	1,917
% increase	6.3	7.6	7.6	13.3	2.5	
Sheep	1,073	1,341	1,438	1,565	1,719	1,644
% increase	—19.9	—6.7	—8.8	—8.9	4.5	
Swine	957	806	645	419	354	458
% increase	18.7	24.9	53.9	18.3	—22.7	
Horses	587	533	487	465	428	401
% increase	10.1	9.4	4.7	8.6	6.7	
Denmark—						
Cattle	2,254	1,840	1,606	1,470	1,239	
% increase	22.5	8.4	15.3	18.6		
Sheep	767	1,106	1,239	1,558	1,842	
% increase	—30.6	—10.7	—20.4	—15.4		
Swine	1,468	1,168	771	527	442	
% increase	25.6	51.4	46.2	19.2		
Horses	535	449	376	248	317	
% increase	19.1	19.4	8.0	9.7		

TABLE VIII.—ANIMALS ON FARMS, 1860-1910—*Continued*

(Expressed in thousands)						
Country	1910	1900	1890	1880	1870	1860
Germany—						
Cattle	20,631	18,940	17,556	15,787	15,777	14,999
% increase	8.9	7.8	11.2		5.1	
Sheep	11,238	12,958	16,681	21,831	27,310	29,835
% increase	—13.2	—22.3	—23.5	—20.0	—8.4	
Swine	22,147	16,807	12,147	9,206	7,124	6,463
% increase	31.7	38.3	31.9	29.2	10.2	
Horses	4,345	4,195	3,836	3,523	3,352	3,194
% increase	3.5	9.3	8.8	5.0	4.9	
Netherlands—						
Cattle	2,027	1,656	1,533	1,470	1,411	1,252
% increase	22.4	8.0	4.2	4.1	12.6	
Sheep	1,113	950	984	1,005	1,037	981
% increase	6.8	—3.4	—2.0	3.1	5.7	
Swine	1,260	747	597	335	329	271
% increase	68.6	25.1	78.2	1.8	21.4	
Horses	327	295	273	278	252	243
% increase	10.8	8.0	—1.7	10.3	3.7	
Belgium—						
Cattle	1,866	1,646	1,421	1,383	1,242	1,258
% increase	13.3	15.8	2.7	11.3	—1.2	
Sheep			477	614	783	583
% increase			—22.3	—21.5	34.3	
Swine	1,116	1,015	1,163	646	632	458
% increase	9.9	—12.7	80.8	2.2	37.9	
Horses	255	244	272	272	283	277
% increase	4.5	—10.2		—3.8	2.1	
France—						
Cattle	14,298	14,521	13,563	11,446	11,358	12,812
% increase	—1.5	7.0	18.4	0.7	—11.3	
Sheep	18,776	21,737	23,164	24,038	25,388	31,256
% increase	—13.6	—6.1	—3.6	—5.3	—18.7	
Swine	7,306	6,740	6,017	5,566	5,630	6,038
% increase	8.3	12.0	8.1	—1.1	—6.7	
Horses	3,160	2,903	2,862	2,849	2,755	2,914
% increase	8.8	1.4	0.5	3.4	—5.4	

TABLE VIII.—ANIMALS ON FARMS, 1860-1910—*Continued*

(Expressed in thousands)

Country	1910	1900	1890	1880	1870	1860
Italy—						
Cattle	6,199	5,500	5,000	4,772	3,489	
% increase	12.7	10.0	4.7	36.7		
Sheep	13,878	11,200	8,700	10,612	8,666	
% increase	23.9	28.7	—18.0	22.4		
Swine	2,508	2,150	1,800	1,164	1,554	
% increase	16.6	19.4	54.6	—25.0		
Horses	1,293	1,069	1,020	962	697	
% increase	20.9	4.8	6.0	38.0		
Austria—						
Cattle	9,160	9,511	8,644	8,584	7,425	
% increase	—3.6	10.0	0.7	15.6		
Sheep	3,685	3,641	4,223	4,847	6,005	
% increase	1.2	—13.7	—12.8	—19.2		
Swine	6,432	4,683	3,550	2,722	2,551	
% increase	37.3	31.9	30.4	6.7		
Horses	1,083	1,716	1,548	1,463	1,390	
% increase	5.0	10.8	5.8	5.2		
Hungary—						
Cattle	7,153	6,738	6,100	5,311	5,279	
% increase	6.1	10.4	14.8	0.6		
Sheep	8,214	8,431	9,000	10,171	15,650	
% increase	—2.5	—6.3	—11.5	—35.0		
Swine	5,490	7,330	5,700	4,160	4,443	
% increase	—25.1	28.5	37.0	—6.3		
Horses	2,174	2,308	2,160	2,079	2,159	
% increase	—5.8	6.8	3.8	—3.7		
Roumania—						
Cattle		2,589	2,520	2,376		
% increase		2.7	6.0			
Sheep		5,888	5,212	4,900		
% increase		12.9	6.3			
Swine		1,709	926	886		
% increase		84.5	4.5			
Horses		864	595	533		
% increase		45.2	11.6			

TABLE VIII.—ANIMALS ON FARMS, 1860-1910—*Concluded*

	(Expressed in thousands)					
Country	1910	1900	1890	1880	1870	1860
Bulgaria—						
Cattle	1,696	1,596	1,426			
% increase	6.2	11.9				
Sheep	9,515	8,421	8,130			
% increase	12.9	3.5				
Swine	465	368	462			
% increase	26.3	—20.3				
Horses	538	495	344			
% increase	8.6	43.8				
Algeria—						
Cattle	1,128	1,035	1,095			
% increase	8.9	5.4				
Sheep	13,033	11,977	11,285			
% increase	8.8	6.1				
Swine	110	81	87			
% increase	37.4	—6.9				
Horses	227	216	215			
% increase	5.0	0.4				
Uruguay—						
Cattle	8,193	6,827	4,963			
% increase	20.0	37.5				
Sheep	26,306	18,629	14,555			
% increase	41.2	27.9				
Swine	180	94	30			
% increase	91.4	213.3				
Horses	556	561	356			
% increase	—0.8	57.5				
Argentina—						
Cattle	28,828	21,702	21,962			
% increase	32.8	—1.1				
Sheep	73,013	77,128	68,600			
% increase	—5.3	12.4				
Swine	1,404	653	394			
% increase	115.0	65.7				
Horses	8,435	4,447	4,234			
% increase	89.6	5.0				

TABLE VIII.—ANIMALS ON FARMS, 1860-1910—*Continued*

(Expressed in thousands)

Country	1910	1900	1890	1880	1870	1860
Chile—						
Cattle	1,640	2,675				
% increase	—38.6					
Sheep	3,748	4,528				
% increase	—19.4					
Swine	160	339				
% increase	—52.8					
Horses	415	746				
% increase	—44.3					
Spain—						
Cattle	2,369	2,497	2,218	2,550	2,905	
% increase	—5.1	12.5	—13.0	—12.2		
Sheep	18,334	15,920	15,894	19,000	22,055	
% increase	15.1	0.1	—16.3	—13.8		
Swine	2,424	2,080	1,928	3,000	4,265	
% increase	16.5	7.8	—35.7	29.6		
Horses	520	440	397			
% increase	18.1	10.8				
Japan—						
Cattle	1,384	1,261	1,057			
% increase	9.7	19.3				
Sheep	95	62				
% increase	53.2					
Swine	279	181				
% increase	54.1					
Horses	1,565	1,542	1,548			
% increase	1.4	—0.3				
Total—						
Cattle	362,117	314,664	273,945	141,673	107,946	58,817
% increase	15.0	14.8	93.3	31.2	83.5	
Sheep	477,784	458,515	443,513	330,415	229,894	88,723
% increase	4.2	3.3	34.2	43.7	159.1	
Swine	132,914	131,146	111,734	90,801	65,408	47,314
% increase	1.3	17.3	23.0	38.8	38.2	
Horses	84,848	72,926	63,032	47,975	36,369	13,432
% increase	16.3	15.6	31.3	31.9	170.7	

CHAPTER VI

OTHER FOODSTUFFS AND THE POSSIBILITY OF INCREASING THE SUPPLY

ALTHOUGH cereals, pulse, roots, and meat form the staples of the diet of most of the people in the western world, we know that many other articles are also used. It is quite impossible to estimate the extent to which fruit, nuts, garden stuffs, *etc.*, are increasing in the various countries of which we have thus far taken notice. It will be

TABLE IX.—SUNDRY CROPS ¹ IN THE UNITED STATES, 1900 AND 1910

Crop	1910	1900
Vegetables ² \$	216,257,068	120,281,811
% increase	79.8	
Fruit and Nuts ² \$	222,024,216	133,048,721
% increase	66.9	
Orchard Fruits ³	216,083,695	212,365,600
% increase	1.8	
Grapes ⁴	2,571,065,205	1,300,984,097
% increase	97.6	
Tropical and subtropical fruits ² \$..	24,706,753	8,227,838
% increase	200.3	
Nuts ⁴	62,328,010	40,028,825
% increase	55.7	

¹ United States, *Thirteenth Census, Abstract*, p. 360.

² Only data on value available. Vegetables includes all vegetables but potatoes and sweet potatoes. Fruit and nuts include the value of all the articles which appear in this table except vegetables.

³ Quantity expressed in bushels.

⁴ Quantity expressed in lbs.

possible, however, to bring forth a few facts regarding the growth of sundry articles of diet in the United States. We cannot estimate the percentage increase in food values for these different articles, but we may be able to get some general impression of the place which they hold in our modern diet. Table IX shows the growth of various crops in the United States according to the census returns for 1900 and 1910. Besides these crops there are numerous garden crops for which no returns exist.¹ We all know that there are perhaps millions of gardens whose produce never is recorded in the census reports, because the owners themselves do not know how much they produce. But it seems doubtful whether gardens furnish any larger percentage of the total diet of the population now than they formerly did. The development of truck gardening has been very rapid, it is true, but whether it has been rapid enough to supply the customary amount of vegetables to the growing population of our cities is questionable. Moreover, in every small city a few years ago there were numerous gardens, almost every house having its garden, but to-day—even where there is plenty of land—there are not as many gardens as formerly. Each generation of city-dwellers get a little farther from the soil, and we find people buying green groceries to-day who would have raised them a few years ago. If anyone doubts that this is the case let him visit the stores of a few of the small towns having from 1,500 to 5,000 population, and find out from the merchants from whom they are getting their green groceries and to whom they are selling them. It is very questionable whether the growth in truck gardening is keeping pace with the demand for green groceries caused by the decrease of produce from kitchen gardens. I do not mean that there is actually a smaller quantity of garden

¹ United States, *Thirteenth Census, Abstract*, p. 360.

stuffs produced in kitchen gardens now than formerly, but that the proportion of the diet so produced is smaller than formerly. In many cases even the prosperous farmer of the Middle West is found buying his vegetables in the nearby town, while it is a well-known fact that many small farmers of the Eastern States scarcely supply their own needs.

Rice shows a very substantial gain in quantity produced in recent years, and also a gain in production per acre. The gain in production between 1900 and 1910 was 142.6 per cent and the increase in acreage but 78.3 per cent.¹ But even with this large increase in production the index number for the price of rice rose about 6 per cent between 1900 and 1907.²

We have seen that most of the crops which might be classed as miscellaneous crops show a substantial increase in quantity produced in recent years—a much greater increase, for the most part, than we found in the case of cereals and animals. Does this mean that these articles of diet are replacing those we usually regard as staple? To think this would be a mistake. In the first place, there is the fact mentioned above, that many people who raised their own vegetables a few years ago now buy them. Then there is the fact that the workingman of to-day when he buys fruit, garden truck, *etc.*, does not do it to take the place of some staple which has heretofore been in his diet, nor even to lessen the quantity of this staple, but rather to increase the quantity and quality of his diet. A considerable acquaintance, at first hand, with laboring men leads me to believe that this is the case, and that the laborer suffers as much hardship in being deprived of these delicacies as he would if de-

¹ United States, *Thirteenth Census, Abstract*, p. 360.

² The later reports of the Department of Labor do not include rice in their price investigations. Bureau of Labor Statistics, *Bulletin*, whole no. 132, no. 10, pp. 14, 15. For index numbers see *Bulletin*, no. 77.

prived of some of the staples. This is to say, the increased standard of living and the proportional decrease in number of kitchen gardens make it improbable that the staples are less staple to-day than they were twenty or thirty years ago, and also make it improbable that the greatly increased apparent production which has taken place in the last few years, according to census reports, is a proportional increase. This is not to say that in some cases and in some classes of the population the staples are not changing, but that this is true of any considerable part of the population does not seem likely. The investigation made by the Bureau of Labor, the results of which appeared in the Eighteenth Annual Report, 1903, confirms the above conclusion, for in 2,567 working men's families from which it was possible to get itemized accounts of expenditure for food it was found that only 10.82 per cent of the total was spent for vegetables and fruit other than potatoes.¹ This shows that vegetables and fruit are not becoming staples of diet among the working classes. This 10.82 per cent must also include the expenditure for canned goods, because no separate percentage is given for them. There is an item in the list entitled "other food" which comprises 6.24 per cent of the expenditure for all food. It would not be reasonable to suppose that any great proportion of this 6.24 per cent was spent for canned goods. At the most, then, we may estimate 12.0 per cent as the proportion of the total expenditure which went to buy vegetables and fruit, including canned goods.

There can be no doubt but that with the growing concentration of population, canned goods have tended to take the place of green groceries. There is no means of proving that canned goods have or have not increased the total con-

¹ United States, Dept. of Labor, *Eighteenth Annual Report*, p. 82.

sumption of vegetables and fruits by the laboring classes. My own opinion (based upon acquaintance with and observation of laborers) is that the total amount of vegetables and fruit used to-day (potatoes excluded) is no greater than it was a few years ago. My opportunities for observation have been greatest in the agricultural states of the middle west, where one would naturally expect to find the people supplying their own wants for vegetables and fruits to a greater extent than in the more thickly populated states in the eastern part of our country. Even here the great dependence of the people upon the market for green groceries and canned goods shows that the proportion of their own wants which they are supplying from their gardens to-day is steadily growing less. The conclusion which I draw from these facts is that, even though the census reports show a very rapid growth in the quantity of vegetables and fruit produced in the last decade or two, this is not conclusive proof that there is a greater amount of these foods available for consumption per capita than formerly. The greater amount is only apparent. It is due to the concentration of agricultural production which makes it possible for the census bureau to obtain more accurate data now than it could at an earlier time. We must, however, recognize that at present the data are very inadequate and that they are not comparable over a series of years.

POULTRY

The census returns on poultry and eggs produced are so incomplete that it is impossible to tell anything definite about the numbers.¹ The total values for 1900 and 1910 are given, and they are much more reliable. The value of poultry raised in 1910 is reported as \$202,506,272, while

¹ United States, *Thirteenth Census, Abstract*, p. 353.

that raised in 1900 is given as \$136,830,152, or a gain of 48.0 per cent.¹ The index number for price of chickens rose from 100.8 in 1900 to 131.4 in 1907 on the base 1890-99,² and there is good reason to believe that it rose much more up to 1910. For this reason it seems doubtful whether the number of chickens (which form about 95 per cent of the total poultry)³ is increasing very rapidly. Twenty per cent would seem to be a very liberal rate of increase to allow, and even this should probably be lower when we take into account the better enumeration in 1910.⁴

The value of eggs sold is reported as \$306,688,960 in 1910 and \$144,240,541 in 1900, or an increase of 112.6 per cent.⁵ But during the same period the index number for price of eggs rose from 99.1 to 158.2 on the base 1890-99,⁶ an increase of about 60 per cent, which is over one-half of the total increase in value. But even after we have made allowance for this increase in price, we must take into account the growing concentration of the poultry business and its effect on the census returns.

The small flock of chickens, like the kitchen garden, is becoming a thing of the past, and people who raised their own chickens a few years ago now rely upon the market to supply them. Besides, poultry has risen more in price than most other commodities, and therefore we should expect that it would be found less on the tables of the middle classes than formerly.

¹ United States, *Thirteenth Census, Abstract*, p. 353.

² United States, *Statistical Abstract*, 1911, p. 556.

³ United States, *Thirteenth Census, Abstract*, p. 336.

⁴ *Ibid.*, p. 353.

⁵ *Ibid.*, p. 353.

⁶ Bureau of Labor Statistics, *Bulletin*, whole no. 132, no. 10, p. 15.

FISHERIES

Another large source of food is fish. The data on quantity of fish caught is entirely lacking for most countries, and is in such form that one cannot express the results quantitatively for several of those countries which have data. For this reason no table of value can be constructed, but the chief facts for a few countries will be set forth briefly.

In the United States the first year for which we have statistics for the catch of fish is 1902. As a matter of fact, the statistics are given for different sections of the country in different years from 1902-1905. I shall speak of them here as though all of the figures were for the year 1903. The total catch for that year was 1,866,171,000 pounds (the salmon catch for Alaska not being included, as there are no data for this year).¹ The catch for the year 1908 was 1,893,454,000 pounds,² a gain of 1.4 per cent in five years. The catch of salmon in Alaska in 1908 was 206,718,000 pounds.³ We cannot tell the rate of increase because we have no earlier data. The number of persons employed in the industry in 1908 was 143,881 and the capital invested was \$42,020,932.⁴ The value of the products was \$54,030,629.⁴ We do not have these same data for earlier years. The increase of the fish caught by the fishermen of the United States during this five-year period would not lead one to believe that fish are replacing other kinds of meat in our diet.

The statistics of Canada regarding fisheries are more complete than those of the United States. The value of the catch in 1910 was \$29,695,433; in 1900, \$21,557,639;

¹ United States, *Statistical Abstract*, 1911, p. 170.

² *Ibid.*, p. 174.

³ *Ibid.*, p. 170.

⁴ *Ibid.*, p. 175.

in 1890, \$17,714,902; in 1880, \$14,499,979.¹ The percentages of increase are, respectively, 37.7, 21.6, 22.1. The number of persons engaged as fishermen in 1910 was 68,610; in 1900, 71,859; in 1890, 63,726; in 1880, 60,657.² The percentages of increase are, respectively,—4.5, 12.7, 5.0. The total capital invested was: 1910, \$19,019,870; 1900, \$10,990,125; 1890, \$7,372,641; 1880, \$3,936,582.³ The percentages of increase are, respectively, 73.0, 49.0, 87.2.

From these percentages it appears that the number of fishermen has been decreasing in the last decade, while the capital invested increased very rapidly. The value of the catch of fish increased about one-half as fast as the capital invested. It is quite doubtful, however, whether the 37.7 per cent increase in the value of the 1910 catch represents a like increase in quantity of fish, for the general level of wholesale prices in Canada was 27.3 per cent higher in 1911 than the average for the decade 1890-99.⁴ If the price of fish rose to the general level of prices, the increase in quantity was probably not more than 10.0 per cent. There is no way to set off decrease in numbers of fishermen against increase in capital invested, and so it is impossible to say whether the fisheries of Canada are working in the stage of increasing or diminishing returns. That is to say, if we found a consistently rapid increase in capital invested and men employed, and that the quantity of fish was increasing but slowly, there would be good reason to believe that, even at this early stage, the Canadian fisheries were working in the stage of diminishing returns. As was said above, no definite conclusion can be drawn from the

¹ *The Canada Year Book*, 1911, p. 387.

² *Ibid.*, p. 390 and 1898, p. 176.

³ *Ibid.*, 1911, p. 390.

⁴ *Ibid.*, p. xxxiii.

facts. But they suggest very strongly that the law of diminishing returns is in operation.

In France the number of men engaged in the fishing industry was 161,305 in 1901, 146,631 in 1890, and 136,370 in 1881.¹ The percentages of increase are, respectively, 10.0 and 7.5. The value of the catch was 126,030,000 fr. in 1901, 107,563,000 fr. in 1890, and 82,670,000 in 1880.² The percentages of increase are, respectively, 17.1 and 30.1. These percentages of increase become more significant when we consider the index number for prices of foodstuffs. Taking 1881 as a base, the index number in 1890 was 79.3 and that in 1901 was 72.7.³ For this reason the percentage increase in quantity of fish caught must have been considerably above the percentages of increase in value. The data on the amount of capital invested in the industry are not available.

There are some data for the fisheries of Norway and the Netherlands in the *Stat. Abstract for the Principal and Other Foreign Countries*, but they are not complete enough to enable one to draw any conclusions as to increase or decrease of quantity caught, and there is no way of correlating the quantity caught with the expense of catching them. For these reasons the statistics of these countries will not be given here.

The *Statistical Abstract for the United Kingdom* gives the quantity and value of fish landed on the coasts of the United Kingdom, but it does not give the number of men employed nor the capital invested. There were 22,371,221 cwts. landed in 1910, 14,671,070 cwts. in 1900,⁴ 12,768,892

¹ Board of Trade, *Stat. Abs. for the Princ. and Other Foreign Countries*, no. 23, pp. 320, 321; no. 33, p. 352.

² *Ibid.*, *loc. cit.*

³ March, *Bull. de l'inst. internat. de stat.*, vol. xix, pt. iii, pp. 222, 223.

⁴ Board of Trade, *Stat. Abs. for the Un. Kingdom*, no. 60, pp. 350, 351.

cwts. in 1890.¹ The percentages of increase are, respectively, 52.4 and 14.8.

Although the fisheries of the countries mentioned have shown gains in most cases, these gains have not been large except in the case of the United Kingdom. It is impossible, however, to tell the rate of increase in the quantity of fish caught. It is also impossible to tell anything about the cost of catching fish to-day as compared with the cost a few years ago. The only country where there were any data making possible such a comparison — Canada — had certain factors entering in which made any definite conclusions out of the question, although these data seemed to point to an increasing cost for catching the same quantity of fish.

This brief survey of the growth of the food supply, other than staples, while showing that many of these sources of food are increasing quite rapidly, does not justify the conclusion that they are increasing so rapidly that they are replacing the staples. Nor does it justify the conclusion that in the United States as a whole these sources of food are being added to the diet of the great masses of the people. We have seen that the growing concentration of production of these various kinds of food makes it easier to secure more accurate data. Besides, there is the fact that an increasingly great number of people are not in a position to supply in part their own wants as was the case a few years ago.

What is true of the United States is probably true of the more developed of the European nations, and will sooner or later be true of the nations which are just entering upon a period of rapid development. Lest this should seem a broad and hasty generalization, I ask the reader to reserve

¹ Board of Trade, *Stat. Abs. for the Un. Kingdom*, no. 50, pp. 214, 215.

judgment until I have discussed the growth of food supply in connection with the growth of population in a later chapter.

POSSIBILITIES OF AGRICULTURE IN THE UNITED STATES

We will turn now from a study of the increase of various foodstuffs to the possibilities of agricultural development. The United States is even yet one of the newer countries, and its possibilities are certainly greater than those of any other country in the temperate latitudes.¹ Since this is the case, it will not be necessary to attempt such a study for other countries.

The possible extension of the area of cultivation by means of irrigation is one of the first things that comes to mind when we think about this matter. We hear much about the vast areas of arid land which can be reclaimed by irrigation—so much that one is inclined to think at times that almost all of the arid lands of our country only await the building of canals into them in order to become the garden-spots of the nation.

I shall quote from a letter sent me by Mr. Samuel For-
tier, Chief of Irrigation Investigations of the Department
of Agriculture:

1. Area of irrigated land in the United States, 1909—13,738,485 acres.
2. Approximate area irrigated at present (Nov., 1913)—15,500,000 acres.
3. Estimated area of irrigated land when all available water is used and transported by present methods, less necessary deduction for drainage, proportionate acreage of different crops remaining as at present—50,000,000 acres.
4. Estimated area of irrigated land when all available water is transported with minimum waste without regard to cost

¹ With the possible exception of Russia.

- of construction of conduits, less necessary deduction for drainage, proportionate acreage of different crops remaining as at present—65,000,000 acres.
5. Estimated area of irrigated land with most perfect known transmission of water and optimum utilization upon the fields, less necessary deduction for drainage, proportionate acreage of different crops remaining as at present—90,000,000 acres.
 6. Probable area which could be profitably irrigated at present prices of farm products, labor, land, and capital—45,000,000 acres.

The statistics given here show us that the extension of tillable lands through the development of irrigation, if carried to its maximum in this decade, would not exceed 76,000,000 acres, or 8.6 per cent increase in the area already in farms, or 15.8 per cent in the area of improved land in farms¹ (supposing that all irrigated lands are improved lands). But if we take 45,000,000 acres as the most which we can expect to see irrigated under present conditions, then the increase in total farm lands from this source would be only 31,000,000 acres, or 3.5 per cent, while the increase in improved land would be only 6.4 per cent. At best, then, we cannot look for very great extension of the area of cultivation through irrigation. The crop yield might easily be raised more than the acreage under cultivation. But of this and its consequences more will be said later.

Those who are very sanguine about the future of our agriculture will at once point to the fact that at present only 46.2 per cent of our land area is included in the farms,² and that of the land in farms 54.4 per cent is improved,³

¹ The area now in farms is 878,798,325 acres, and the area improved is 478,451,750 acres. See *Thirteenth Census, Abstract*, p. 265.

² *Thirteenth Census, Abstract*, p. 265.

³ *Ibid.*, loc. cit.

which is only 25.1 per cent of the total land area of the country. Let us see, then, how much we can expect to see the area of land in farms increased. According to a map prepared by Alfred J. Henry, of the United States Weather Bureau, showing the normal annual precipitation in the United States 1870-1901,¹ there are about 464,597,000 acres of land in the western part of the country where the annual precipitation is 15 inches or less. The map referred to shows only the average annual precipitation. I have obtained the above figures by estimating as carefully as possible the proportion of certain states which have an average annual precipitation of 15 inches or less.² If we subtract the maximum area of irrigation from this arid area we have left 374,597,000 acres which cannot raise normal crops and much of which cannot raise crops of any kind. This is supposing, too, that all the irrigated area of the nation is to be found in these arid states. Moreover, this does not take into account the arid portions of the Dakotas, Nebraska, Kansas, Oklahoma, and Texas, nor is account taken of those parts of the country which are mountainous, and therefore untillable. Besides, there is much waste land in the eastern part of the country which cannot be estimated. When we find that only about one-third of the area of Maine is under cultivation, a little over one-half of the area of Michigan, about four-sevenths of the area of Minnesota, and a little over one-seventh of the area of Florida,³ we may legitimately conclude that there is a large amount of land in these states which is untillable. I shall not attempt to make any estimate of the quantity of this land, but when

¹ This map is published by the Department of Agriculture and can be obtained upon request.

² Wash. 1-4, Ore. 1-3, Calif. 1-3, Ariz. 9-10, N. M. 5-6, Nev. all, Idaho 2-3, Montana 1-2, Wyoming all, Utah 7-8, Colo. 1-8.

³ *Thirteenth Census, Abstract*, p. 269.

we think of these things it will be seen that the estimate of arid lands given above is a conservative estimate of the land which is now untillable and the prospects for tilling which are very remote. To this arid area we must add the area of the National Forests in continental United States. This area was 163,793,443 acres on June 30, 1911.¹ (There are other forests which belong to individuals or corporations the area of which is not known, and therefore cannot be taken account of.) To this we must add the swamp and overflow lands, which amount to 74,541,700 acres according to the report of the National Conservation Commission.² Part of this will be reclaimed in time, but much of it will be useless for an indefinite length of time.

The cities of the United States occupy an immense amount of land which can never be of use in agriculture. There are in the United States 14,186 towns and cities.³ Estimating the density of population for the largest cities at 10,000 per square mile, and gradually lowering it until that for places of 2,500 or less was estimated at 500 per square mile, the total area of incorporated cities and towns is 34,981 square miles, or 22,387,840 acres. When we add the areas of arid lands, national forests, swamp and overflow lands, and land in cities, we get a total of 635,319,953 acres which cannot be used for agricultural purposes at present, and most of it at no time, so far as we can see. When we subtract this area from the total land area—1,903,289,600⁴ acres—we have left 1,267,969,617 acres, of which 69.3 per cent is already in farms.⁵ But there are still subtractions to be made. There are roads between every

¹ *Statistical Abstract*, 1911, p. 163.

² *Ibid.*, 1911, p. 32.

³ *Thirteenth Census, Abstract*, p. 59.

⁴ *Ibid.*, p. 265.

⁵ *Cf. supra*, p. 83 note.

section of land in the settled part of the country. If we estimate eight acres to every square mile used in this way (which is not quite one-half of the area actually given to highways in most cases), or one-eightieth of the total tillable area (not including subtractions made above), we find that there are 15,849,620 acres used in this way. When this subtraction is made we have left 1,252,119,997 acres.¹ Now, if we add the possible extension of irrigation—about 76,000,000 acres—to the area already in farms—878,798,325 acres—and subtract this from the possible extension of land in farms—1,252,119,997 acres—we get 297,321,672 acres which can be added to the area in farms in the future. This is 31.1 per cent increase on the area of land in farms in 1910 plus the possible extension through irrigation.

The fact that the area of land in farms increased only 4.8 per cent² between 1900 and 1910 shows that most of this land is as yet beyond the margin of profitable cultivation. Thus, while it would be sheer nonsense to claim that there are not great possibilities for the extension of the area of land in farms, it is by no means nonsense to claim that the land which is not yet in farms, but is available to be used for agricultural purposes, will only come into use as the margin of cultivation is extended and the prices of foodstuffs make it profitable to use this land.

¹ Lest the subtractions made should seem too high to some I will mention some additions which might be made. The railroads of the United States had over 244,000 miles of track in 1911 (see *Stat. Abstract of the United States*, 1912, p. 304). At a very conservative estimate this means six acres per mile taken from agricultural uses. This amounts to 1,464,000 acres. Moreover this does not include any of the switching and terminal facilities of the railroads themselves nor any of the lines of switching and terminal companies, which together amount to about 89,000 miles in length (*loc. cit.*). Besides the railroads proper, the electric interurban lines are increasing year by year and in many cases do not keep to the regular highways.

² *Thirteenth Census, Abstract*, p. 265.

Regarding the possibility of extension of improved land in farms, little can be said. As was mentioned above, all irrigated lands are improved lands and, as a rule, yield more per acre than the ordinary farm lands. It seems probable, on the whole, that the possibility of extending the area of improved land is greater than that of extending the total area of farm lands. The area of improved lands increased 15.4 per cent ¹ between 1900 and 1910. At this rate of increase there would be about 1,000,000,000 acres improved by 1960, and this seems to be a generous upper limit for increase in improved lands. But this does not mean that there are a billion acres of land which could be improved and yield as much as the present improved land with the same amount of labor and expenditure of capital. The improved lands, as all farm lands, will increase as the margin of cultivation is extended, but it will require a larger and larger amount of capital and labor to secure returns equal to those which the farmer is getting at present.

This brings us to the question of diminishing returns, which will be discussed in a later chapter.

¹ *Thirteenth Census, Abstract*, p. 265.

CHAPTER VII

IMPORTS AND EXPORTS OF FOODSTUFFS

THIS chapter can be very brief and yet serve its purpose, which is to show the trend in the importation and the exportation of foodstuffs in the most important countries of the western world. The only way this can be done for foodstuffs as a whole is by expressing the quantity of them in terms of value.

Of course, the percentage of increase or decrease in value will not give us the percentage of increase or decrease in actual amount of foodstuffs, but by the aid of the index numbers in Chapter III an approximate estimate can be made for several of the more important countries. Besides, the rise in price denoted by the index numbers for these countries will apply with reasonable accuracy to the other countries which import or export considerable quantities of foodstuffs.

If a fuller knowledge of the more important articles of food which are imported or exported is desired, the reader is referred to Appendix C. In that place will be found a list of the imports and exports itemized as minutely as seemed feasible in a study of this nature. These tables do not contain complete details in any case, but they contain the most important articles imported and exported in every case, and will give a fairly accurate notion of the movement of foodstuffs in and out of the various countries. In those cases where "total value" is given for a nation (as in the condensed table in this chapter), it includes all articles of food either going into or coming out of that country.

There are some fluctuations from year to year in the various countries, but these are not nearly so large as one might suppose, and so these data represent to a reasonably accurate degree the real trend in the shipment of foodstuffs from country to country in the western world.

The sources of these tables are as follows: for the United States, the *Statistical Abstract of the United States*; ¹ for the United Kingdom, the *Statistical Abstract of the United Kingdom*; for the British Possessions, the *Statistical Abstract for the Colonies and Self-Governing Possessions of the British Empire*; for the other countries, the *Statistical Abstract for the Principal and Other Foreign Countries*.

TABLE X.—VALUE OF EXPORTS AND IMPORTS OF FOOD STUFFS 1860-1910
(Expressed in thousands)

Country	1910	1900	1890	1880	1870	1860
United States—						
Total value.....	\$369,088	545,474	356,830	459,462	92,772	50,791
% increase.....	—32.3	52.8	—22.3	395.2	82.6	
United Kingdom—						
Total value.....	£38,945	26,195	23,143	23,594	19,104	11,575
% increase.....	41.0	13.2	—1.9	23.5	65.0	
Russia (roubles)—						
Total value.....	948,650	411,537	404,771	261,621	183,304	
% increase.....	130.5	1.7	54.7	42.7		
Germany (marks)—						
Total value.....	749,000	518,000	471,000	563,000	389,000	
% increase.....	44.6	9.9	—16.3	44.7		
France (francs)—						
Total value.....	858,200	769,200	855,400	666,965	613,100	
% increase.....	11.6	—10.1	28.2	8.8		
Austria-Hungary—						
Total value.....	£9,684	13,109	14,650	11,933		
% increase.....	—26.1	—10.5	22.7			

¹ The data regarding the United States for 1860 are taken from the *Report on Commerce and Navigation* for that year.

TABLE X—VALUE OF EXPORTS AND IMPORTS OF FOOD STUFFS 1860-1910—*Concluded*

	(Expressed in thousands)					
Country	1910	1900	1890	1880	1870	1860
Italy (lire)—						
Total value.....	613,219	349,479	255,229	329,202	246,675	
% increase	75.5	36.9	—22.5	33.5		
IMPORTS						
United States—						
Total value.....	\$326,343	230,944	261,812	218,422	150,235	89,515
% increase	41.3	—11.7	19.8	45.3	67.8	
United Kingdom—						
Total value.....	£257,682	219,970	176,137	183,527	110,969	85,357
% increase	17.1	24.9	—4.0	65.4	30.0	
Russia (roubles)						
Total value.....	190,843	115,733	83,453	132,892	52,317	
% increase	64.9	38.7	—37.2	154.0		
Germany (marks)—						
Total value.....	2,467,000	1,763,000	1,397,000	1,258,000	1,009,000	
% increase	39.9	26.2	11.0	24.7		
France (franca)—						
Total value.....	1,413,000	819,400	1,445,100	1,714,753	691,800	
% increase	72.5	—43.3	—15.7	147.8		
Austria-Hungary—						
Total value.....	£10,000	11,517	7,991	11,208		
% increase	—13.1	45.9	—29.5			
Italy (lire)						
Total value.....	659,866	290,484	318,921	205,972	218,122	
% increase	127.2	—8.9	54.8	—5.6		

CHAPTER VIII

THE MOVEMENT OF POPULATION 1860-1910

TABLE XI shows the various phases of the movement of population during the last half-century for the more important of the European nations and for the more important countries which they have colonized. Its purpose is to show the tendency of the movement of population in these countries and to give a fairly accurate idea of the expansion of the European peoples.

THE BIRTH RATE

Much has been written recently on the subject of the birth rate. It is a generally known fact that the birth rate is declining. Regarding the significance of this fact there are many divergent views. Some people think that a declining birth rate means that the nations in which this is taking place are losing their vitality. Others look upon it as a sign of advancing civilization and believe it indicates that more attention is being paid to the rearing of children fitted to carry on the development of modern civilization.

If we turn to this table we see that the birth rate is declining in nearly all countries. Bulgaria, Roumania and Japan are the only countries among those given here where the birth rate is higher at the end of the last decade than for former decades for which data are available. In the United States there are no statistics except for a few of the states. I have given here the data for Massachusetts, which show that the birth rate in this state has remained almost stationary since 1860, at which time it was a little

higher than at present. The reason that the rate in Massachusetts has not declined is not hard to find.

In Massachusetts in 1870 the native-born population of native parents constituted 57.0 per cent of the total population. The native-born of foreign and mixed parentage and the foreign-born constituted 43.0 in the same year.¹ In 1890 the percentages were exactly reversed.² During this same period of twenty years the native population born of native parents increased 15.6 per cent, while the native population born of foreign and mixed parentage and the foreign born increased 100.2 per cent. In the next twenty years (1890-1910) the native population born of native parents decreased from 43.0 per cent to 32.8 per cent, while the native population born of foreign and mixed parentage and the foreign-born increased from 57.0 per cent to 67.2 per cent of the entire population. During this same period the native population born of native parents increased but 14.7 per cent, while the native-born of foreign and mixed parentage and the foreign-born increased 77.1 per cent.³ Thus it appears that while the birth rate of the native population has been declining, the large immigration of foreigners into Massachusetts in the last forty years has kept the birth rate almost up to its earlier standard. This is much more evident if we consider the native-born population of foreign and mixed parentage only. Between 1870 and 1890 it increased 122.2 per cent, and between 1890 and 1910, 93.0 per cent. Thus it is easily seen that the rapid increase of foreigners having a high birth rate is the cause of the maintenance of the relatively high birth rate of Massachusetts. These foreigners could have a

¹ *Ninth Census, Population*, p. 312.

² *Eleventh Census, Population*, vol. i, p. 615.

³ *Thirteenth Census, Abstract*, p. 83.

much lower birth rate than they formerly had and still it would be higher than that of the native American population. Besides, we should expect that the age-groups of the immigrants would give them a high birth rate. Thus, while Massachusetts is an apparent exception to the rule, when we take into account the changes in the character of the population and in the age-groups there is no doubt that the birth rate is declining there as in most of the other countries. The very slow rate of increase of the native-born of native parents shows that the birth rate for this part of the population must be very low even if we allow something for the emigration of native stock.

It is impossible to secure any data on the birth rate in the United States as a whole, but in the table in this chapter I have endeavored to calculate a rate of increase which will approximate as nearly as possible the true rate of natural increase as explained on page 100. This rate was obtained by subtracting the net immigration for each decade from the total population at the end of that decade and then calculating the rate of increase upon the total population at the end of the preceding decade. This is not as accurate as we should like, but it shows clearly that the birth rate has been steadily falling since 1880. There are several factors which should be taken into account in considering this as a rate of natural increase. In the first place, all the immigrants of the preceding decade are counted as a part of the population upon which the rate of increase is calculated. Of course there are more men among the immigrants who have stayed than there are women. As a consequence, it might be urged that one could not fairly count the immigrants of the preceding decade among the people constituting the base on which the rate of increase is calculated. This objection is of little force, however, because so large a percentage of the immi-

grant women belong in the child-bearing age-groups that they compensate for the undue proportion of single men among the immigrants. Besides, deductions have already been made for the immigrants who returned home, so that a large part of the surplus of immigrant men is not included in the calculations at all.

It seems fair, then, to regard the decrease in the rate of natural increase in the United States as a statement of the declining birth rate. This statement is probably conservative, too, when we take into consideration the declining death rate.

Another way to show that the birth rate is declining in the United States is to compare the proportion of children to the number of women of child-bearing ages for a series of years. This is a fair comparison, because, as will be shown a few pages later, the age of women at time of marriage has not changed materially during the last thirty or forty years. This comparison shows that per thousand women fifteen to forty-nine years of age there were 626 children under five years of age in 1850; this number had fallen to 572 in 1870, to 485 in 1890, and to 446 in 1910—altogether a decrease of 180 children per thousand women fifteen to forty-nine years of age during this period of sixty years. If we make the same comparison for white people only, the numbers are as follows: in 1850 there were 613 children to 1,000 women fifteen to forty-nine years of age; in 1870 there were 562, in 1890 there were 473, and in 1910 there were 440—a decrease of 173 during this sixty-year period.¹

If we take into account only the married, widowed and divorced women from fifteen to forty-four years of age,

¹ United States, *Bureau of the Census, Bulletin*, no. 22, by W. F. Willcox, and *Thirteenth Census, Abstract, Population*, chaps. ii and iii, *passim*.

we get the following results: in 1890 there were 895 children under five years of age per thousand married, widowed or divorced women from fifteen to forty-four years of age in the United States; in 1900 the number of children had fallen to 865, and in 1910 to 792—a decrease of 103 in twenty years. If we consider only native children under five years of age born of native mothers, married, widowed or divorced, the numbers of children are 777 in 1890, 744 in 1900, and 706 in 1910—a decrease of 71 in twenty years. If we consider the children under five years of age born of foreign mothers, married, widowed or divorced, the numbers of children are: 1,259 in 1890, 1,287 in 1900, and 1,119 in 1910—a decrease of 140 in twenty years and of 168 since 1900. In the negro population the number of children in the same age group per thousand women fifteen to forty-four years of age fell from 997 in 1890 to 773 in 1910.¹ Thus it seems very clear that there has been a rapid decrease in birth rate in the United States in the last few decades. It is also apparent that the immigrants with their high birth rate are furnishing a greater proportion of the children from decade to decade, although the birth rate is declining among them also, as these statistics show.

Thus it appears that the birth rate is declining throughout the civilized world. The question with which we are concerned is: What are the causes of this decline? Dr. Newsholme, in a tract entitled *The Declining Birth-Rate*, has made a study of some of the factors which might bring about this result. On the whole, our data, which are more complete and more up-to-date than his, corroborate his conclusions.

¹ The statistics for the proportion of children under five years of age to married, widowed, and divorced women 15-44 years of age cannot be obtained prior to 1890.

Let us look at the marriage rate to see whether it has changed to such an extent that it would have an effect upon the birth rate. A careful study of the marriage rates and birth rates as given here fails to reveal any change in marriage rates of sufficient magnitude to affect the birth rates. It is worth notice, however, that the three countries which showed an increased birth rate do show a somewhat increased marriage rate, and that Roumania, which shows the greatest increase in birth rate, shows also a very marked increase in marriage rate. On the whole, however, there is practically no change in marriage rates. They seem to rise or fall but little at any point in the time covered by this table. Our study, then, corroborates Dr. Newsholme's conclusion that the marriage rate has not changed sufficiently to influence the birth rate. Besides, even where there are changes in the marriage rate, they do not show any tendency, but seem rather to be local and temporary. The proportion of people marrying to-day is not smaller than formerly. For this reason the changes in the marriage rate are not a significant cause of the decline in the birth rate.

Furthermore, when the number of women of child-bearing ages has been ascertained for a period of years,¹ it is found that the proportion has not declined and that the results obtained by an examination of the marriage rate are sustained. It is also found that the age at which marriage takes place has not altered to such an extent that it could be an important factor in causing a decline in the birth rate. Dr. Newsholme shows this to be the case for England.² If we turn to the data for Massachusetts we find that the average age of all bridegrooms for the five-year period ending 1886 was 29.0 years, while for the five-year

¹ Newsholme, *The Declining Birth-rate* (New York, 1911), chap. ii.

² Newsholme, *op. cit.*, chap. ii.

period ending 1911 it was 28.9 years — a slight decrease, which is not significant. The average age of all brides in the same periods was 25.3 years and 25.7 years, respectively, a difference of 0.4 of a year, which is not important. But if instead of all bridegrooms and brides we take the ages of those marrying for the first time, we find that that of the bridegrooms was 26.7 years for the earlier period and 27.3 years for the later period—an increase of 0.6 of a year. The ages of brides marrying for the first time for the same periods was 24.0 years and 24.3 years, respectively.¹ None of these differences can be considered great enough to cause the steady decline in birth rates which we noticed above.

There are some reasons pointed out above why Massachusetts might not be considered typical of the United States, *e. g.* the large foreign immigration.

Let us turn, then, to a state in which the population is much more largely native and quite typical of most of the northern states, to see what is taking place there. In Michigan the birth rate for the five-year period 1870-74 was 23.2, for the period 1886-90 it was 23.6, and for the period 1906-1910 it was 23.3. There is practically no change in forty years.² In the same period the death rate has increased from 8.3 for the five-year period 1874-78 to 9.5 for the period 1886-90, and to 14.0 for the period 1906-10.³ The fall in the rate of natural increase is from 14.9 in 1870-74 to 14.1 in 1886-90, and to 9.3 in 1906-10. At the same time the number of marriages remained practically stationary in the two earlier periods, being 8.9 and 8.7, respectively, but rose to 10.4 in 1906-10.⁴ There can

¹ Massachusetts, *The Seventieth Registration Report*, 1911, p. 159.

² Michigan, *Forty-Fourth Registration Report*, 1910, p. 2.

³ *Ibid.*, p. 2.

⁴ *Ibid.*, p. 2.

be little doubt, then, that the number of children per family is falling and that the maintenance of the birth rate is due, to some slight extent, to the increased number of marriages. But it should be noted in regard to the birth rates and death rates in Michigan that it is quite likely they are both too low for the earlier periods taken account of here. This is because of the inadequate registration in the earlier years. There is also the fact that the large immigration of native stock into Michigan from the eastern states tended to lower its death rate for a time. So that the fact that the registration of births and deaths is now quite accurate and that the recent foreign immigration has not raised the birth rate is adequate proof that the birth rate is declining. The large number of single men in the middle-age groups in an earlier time, and inadequate registration, would account for the very low birth and death rates recorded then. Therefore, while it is quite probable that the rate of natural increase was higher formerly than now, it is not probable that the difference is as great as given here. This decrease in the rate of natural increase is just what we should expect in a state where the native stock predominates. We saw, also, that this was the case for the United States as a whole.

During this same period the age at marriage in Michigan has been increasing slightly. It is impossible to give the average age at marriage at successive periods, as in the case of Massachusetts, but if we take the percentages of men and women belonging to the different age groups at marriage, we can see very clearly that there has been some increase in age at marriage. In 1871-75 the percentage of men twenty-nine years of age or under of the whole number of men married was 73.3, while in 1906-10 the percentage had fallen to 71.2. The percentage of women twenty-four years of age or under of the total number of

women married in 1871-75 was 73.4, while that for 1906-10 was 67.5. It is worth noting here that while the percentage of women under twenty years of age married 1871-75 was 36.9, it fell to 27.4 in 1906-1910, while the percentage in the age group 20-24 married during the same period rose from 36.5 in 1871-75 to 40.1 in 1906-1910.¹ This shows without question that the age at marriage is rising slightly in Michigan.

But even though there is an increase in age at marriage in a state where the native population is large, and though the increase is greater in the case of women than of men, it by no means follows that the decline in birth rate is due to the increased age at marriage. The greatest increase was seen in a moving of women from the age group under twenty into that from twenty to twenty-four years of age. A very slight increase in average age might make a large difference in the percentages falling within these various age groups. Dr. Newsholme found that in England the average age of spinsters at marriage had increased from 25.08 years in 1896 to 25.73 years in 1909.² This increase is not large and might easily be adventitious, although there is good reason to think that the age at marriage is increasing somewhat. But from the evidence at hand one is forced to conclude that the postponement of marriage is not a very large factor in the declining birth rate at the present time. It seems far more likely that the same causes which are bringing about whatever postponement of marriage there is are the causes which are active after marriage to reduce the birth rate.

In agreement with Dr. Newsholme, I would conclude, in general, "that volitional limitation of the family is the

¹ Michigan, *Forty-Fourth Registration Report*, 1910, p. 64. All of these data relating to age at marriage will be found on this page.

² Newsholme, *op. cit.*, chap. ii.

chief and vastly predominant cause of the decline in the birth-rate which is taking place in so many countries" ¹

Of the indirect causes of the desire to limit offspring, something will be said in the following chapter.

THE RATE OF NATURAL INCREASE

The rate of natural increase of population is the difference between the birth rate and the death rate. People who view the declining birth rate with apprehension often seem to forget that it is the rate of natural increase which is the important thing. They often overlook the fact that the death rate has been declining as fast as the birth rate. An examination of the death rates as given in this table for the various countries will show that the decline in them has been as universal as the decline in birth rates. Without exception, the countries which show a steady decline in birth rate show a steady decline in death rate. The three nations mentioned above as having increased birth rates in the last decade also have increased death rates, so that it is doubtful whether the rate of natural increase is any larger than it would have been if there had been a decline in both birth rates and death rates. Their rates of natural increase are, however, larger than in most of the other countries.

On the whole, it is by no means clear that the decline in birth rates has meant a decline in the rate of natural increase. In some countries, *e. g.* Australia and New Zealand, there has been a decided falling off in the rate of natural increase, and there is good reason (as I have shown above) to believe that the same is true of the United States. One is inclined to think that the falling off in the birth rate has been greatest where the natural opportunities have been used up the most rapidly, for if we turn to the older European countries we find almost no case of diminution of the rate of natural increase.

¹ Newsholme. *op. cit.*, p. 33.

Moreover, if we consider the net increase in population from decade to decade, we find that in most countries it is as large now as formerly, and this, too, in spite of the large emigration which is taking place from many countries. In the United Kingdom the rate of growth of population does not seem to be lessened appreciably by the large number of emigrants, except for the decade ending 1890. The falling-off in rate of increase of population in 1910 is slight, while the number of emigrants increased over 700,000 between 1900 and 1910. If the number of emigrants had been the same in 1910 as in 1900, the rate of natural increase for the United Kingdom would have been 10.9 per cent, and this is higher than for any preceding decade of which this table takes account.

In recent years, when Russian emigration has become quite large, we find that the rate of natural increase remains high and that the rate of increase of population is higher for the thirteen years ending in 1910 than for any preceding period of equal length. An examination of the facts regarding Austria-Hungary and Italy shows that in these countries the rate of natural increase has decreased little or none and that the rate of increase in population has fallen off only in Hungary, and there but little in spite of the large emigration which is taking place. In the case of no country is it clear that emigration has materially affected the rate of increase of population in that country from decade to decade. Thus an examination of the rates of increase of population and of the rates of natural increase shows beyond doubt that the actual growth of population among the peoples of European origin is not decreased by the decline in the birth rate. The nations individually bear out this conclusion, with only an exception or two, and when we turn to consider the growth of population as a whole in these countries (leaving out of account India and Japan), we find that this conclusion stands.

Although data are lacking for several countries for 1860 and 1870, they can be estimated. Using these estimates, the total population in all these countries was 297,019,000 in 1860, 325,222,000 in 1870, 359,534,000 in 1880, 411,665,000 in 1890, 462,984,000 in 1900, and 532,735,000 in 1910. The percentages of increase are 9.5 per cent between 1860 and 1870, 10.5 per cent between 1870 and 1880, 14.5 per cent between 1880 and 1890, 12.5 per cent between 1890 and 1900, and 15.1 per cent between 1900 and 1910. Thus it is seen that the greatest increase has come in the last decade and that the declining birth rate is not sufficient to lower the rate of natural increase. These totals are not given as totals for the expansion of the European peoples during this fifty-year period, but as fairly representative of the rate of expansion. There are other countries in South America, in Africa, and in the Pacific islands where Europeans have gone but of which I have not tried to take account. But I think that any correction to be made in the totals here given will go to show that there are more Europeans scattered throughout the world from decade to decade, and that if they were to be taken account of that they would probably raise the rate of increase.

In the fifty years from 1860 to 1910 the population of these nations increased 79.36 per cent. This may not seem large, but suppose the same rate of increase were to continue for two centuries. At the end of the first century (2010 A. D.) there would be 1,713,755,000 people of European stock on the earth. This is about equal to the entire population of the world at the present time. At the end of the second century (2110 A. D.) the number of people of European stock would be 5,513,365,000, or about three times the present population of the globe. These are no fantastic figures based on a possible rate of increase. They

are based on what has actually taken place in the last fifty years, during which time the birth rate has been falling continuously. Those who think that the birth rate is falling too rapidly should find food for reflection in these data. To say that the lands which the Europeans are reserving to themselves will not support this vast number of people would be pure assertion, but to maintain that there must be vast improvements in productive processes if these lands are to support this number of people with their present needs and with their growing desires, is well within the bounds of reason.

Those who view the declining birth rate with apprehension seem to take it for granted that the decline is going to continue steadily and that the death rate is now near a minimum. Both assumptions are purely gratuitous. The birth rate may go on declining, as is the case in France; about this we cannot say anything of value, we can only speculate. But about the decline of the death rate, much of value can be said. One needs only to mention the whole movement for public hygiene to see that the possibilities of reducing the death rate are large in this respect. It is needless to enumerate the various aspects of this movement. Preventive medicine is just commencing to demonstrate its possibilities. The "safety first" campaigns, too, are for the purpose of preventing the needless waste of human life, which is very large at present. These are a few of the more important movements by which we can expect to see the death rate reduced in the near future. Besides, when we think of social insurance and its wide ramifications, and the various efforts being made to reduce infantile mortality, we cannot but conclude that the possibilities of reducing the death rate are great, though there is little doubt that each successive reduction will be more difficult to secure than the preceding one.

The conclusion which this chapter warrants is very brief: A study of the movement of population among the European peoples for the last half-century does not indicate that there is any immediate likelihood of population becoming stationary, nor that the rate of increase will slacken materially in the next few decades.

The sources of the statistics in this table are: the *Statistical Abstract for the United Kingdom*, the *Statistical Abstract for the Colonies and Self-Governing Possessions of the British Empire*, the *Statistical Abstract for the Principal and Other Foreign Countries*, the *Reports of the Registrar-General of England*, the *Census Reports and Bulletins* of the United States, the *Abstract of the Report of the Immigration Commission* of the United States, the *Statistical Abstract of the United States*, and the registration reports of Massachusetts and Michigan.

As in the preceding tables specific references have been deemed unnecessary in view of a general statement of sources, because each issue of nearly all of these sources contains the information for a series of years, and the indexes of these volumes enable one to turn at once to the pages on which certain information may be found. A detailed statement concerning all changes in date and number which occur in the tables of this chapter is given in Appendix A.

TABLE XI.—THE MOVEMENT OF POPULATION, 1860-1910 *

	1910	1900	1890	1880	1870	1860
United States—						
Population ¹	91,972	75,995	62,948	50,156	38,558	31,443
% increase	21.0	20.7	25.5	30.1	22.6	35.6
Population of Mass . . .	3,366	2,805	2,239	1,783	1,457	1,231
% increase	20.0	25.2	25.5	22.3	18.3	
Birth rate ² of Mass . .	26.06	25.88	26.73	25.26	26.57	28.42
Death rate ² of Mass . .	16.02	17.29	19.83	19.21	19.45	18.28

* All notes on this table will be found on p. 110.

TABLE XI.—THE MOVEMENT OF POPULATION, 1860-1910—*Continued*

	1910	1900	1890	1880	1870	1860
Rate of natural increase						
of Mass	10.04	8.59	6.9	5.05	7.12	10.14
Marriages ³	9.06	8.62	9.37	8.57	10.33	9.22
Immigrants ⁴	8,795	3,688	5,247	2,812	2,315	2,598
Emigrants ⁵	2,932	1,229	1,749	562	461	519
Net immigration ⁶	5,863	2,459	3,498	2,250	1,854	2,079
Natural rate of increase						
in the United States ..	13.3	16.8	18.5	24.2	16.7	
United Kingdom—						
Population	45,222	41,459	37,733	34,885	31,485	28,927
% increase	9.07	9.87	8.16	10.8	8.84	
Birth rate	25.4	28.3	29.8	32.9	34.8 ⁸	
Death rate	14.9	17.6	18.9	20.0	22.4 ⁸	
Rate of natural increase.	10.5	10.7	10.9	12.9	12.2 ⁸	
Marriages	7.3	7.6	7.1	6.9	8.4 ⁸	
Immigrants ⁷	1,360	1,018	830	847 ⁹		
Emigrants ⁷	2,841	1,743	2,559	1,679 ⁹		
Net emigration	1,481	725	1,729	832 ⁹		
British India—						
Population	315,086	294,316	287,271			
% increase	7.05	2.4				
Immigrants	84					
Emigrants	174					
Net emigration	90					
Australia—						
Population	4,455	3,773	3,183	2,253		
% increase	18.07	18.5	41.2			
Birth rate	27	27	35	36	38 ¹⁰	
Death rate	11	12	15	15	13 ¹⁰	
Rate of natural increase.	16	15	20	21	25 ¹⁰	
Marriages	9	7	7	8	7 ¹⁰	
Immigrants	561					
Emigrants	515					
Net immigration	46					
Canada—						
Population	7,447	5,592	5,035	4,336	3,518	
% increase	33.1	11.0	16.1	23.2		
Immigrants	1,764					
New Zealand—						
Population	1,008	773	627	490		
% increase	30.4	23.2	27.9			

TABLE XI.—THE MOVEMENT OF POPULATION, 1860-1910—*Concluded*

	1910	1900	1890	1880	1870	1860
Birth rate	26	26	29	38	40 ¹⁰	
Death rate	9	10	10	11	10 ¹⁰	
Rate of natural increase.	17	16	19	27	30 ¹⁰	
Marriages	9	8	6	7	7 ¹⁰	
Immigrants	344					
Emigrants	260					
Net immigration	84					
Russia in Europe—						
Population	131,022	106,159	91,862	71,028	65,732	
% increase	23.4	15.5	29.3	8.0		
Birth rate	46.8	48.8	48.6			
Death rate	29.8	31.8	35.8			
Rate of natural increase.	17.0	17.0	12.8			
Marriages	9.6	8.8	8.7			
Emigrants (landed in U. S.)	1,597	612	265	49		
Norway—						
Population	2,392	2,240	2,001	1,813	1,702	
% increase	6.7	11.9	10.3	6.5		
Birth rate	26.1	30.0	30.2	30.9		
Death rate	13.7	15.4	17.4	16.3		
Rate of natural increase.	12.4	14.6	12.8	14.6		
Marriages	6.1	6.8	6.4	6.7		
Emigrants	191	94	187	85		
Sweden—						
Population	5,522	5,136	4,785	4,566	4,169	3,860
% increase	7.5	7.3	4.8	9.5	8.0	
Birth rate	25.1	26.8	27.9	29.6	32.0 ⁸	
Death rate	14.2	16.2	16.8	17.6	20.4 ⁸	
Rate of natural increase.	10.9	10.6	11.1	12.0	11.6 ⁸	
Marriages	6.0	6.1	5.9	6.3	7.0 ⁸	
Emigrants	224	188	376	170		
Denmark—						
Population	2,737	2,450	2,172	1,969	1,785	1,608
% increase	11.7	12.7	10.3	10.3	11.0	
Birth rate	27.8	29.8	30.8	32.0	31.6	
Death rate	13.6	16.1	19.3	19.3	20.3	
Rate of natural increase.	14.2	13.7	11.5	12.7	11.3	
Marriages	7.4	7.3	6.9	7.6	7.9	
Emigrants	73	41	80	39		

TABLE XI.—THE MOVEMENT OF POPULATION, 1860-1910—*Continued*

	1910	1900	1890	1880	1870	1860
Netherlands—						
Population	5,858	5,104	4,511	4,013	3,580	3,309
% increase	14.7	13.1	12.4	12.0	8.2	
Birth rate	29.0	31.9	33.1	37.7	34.3 ⁸	
Death rate	14.3	17.1	20.5	22.2	25.7 ⁸	
Rate of natural increase.	14.7	14.8	12.6	15.5	8.6 ⁸	
Marriages	7.3	7.5	7.0	7.5	7.9 ⁸	
Emigrants	28	24	52	38		
Germany—						
Population	64,926	56,046	49,241	45,095	40,085	37,611
% increase	15.8	13.8	9.2	12.5	6.6	
Birth rate	30.7	35.7	36.3	37.9	40.3 ¹¹	
Death rate	17.4	20.8	23.9	25.8	27.2 ¹¹	
Rate of natural increase.	13.3	14.9	12.4	12.1	13.1 ¹¹	
Marriages	7.9	8.3	7.9	7.6	9.3	
Emigrants	237	206	1,341	530 ¹²		
Belgium—						
Population	7,424	6,694	6,069	5,537	5,088	4,732
% increase	10.9	10.3	9.6	8.8	7.5	
Birth rate	24.4	28.8	29.5	31.6		
Death rate	15.8	18.0	21.2	21.6		
Rate of natural increase.	8.6	10.8	8.3	10.0		
Marriages	7.9	8.3	7.4	6.8		
Immigrants		246	192	150	94	
Emigrants	162	212	176	119	110	
France—						
Population	39,602	38,962	38,343	37,672	36,102	37,386
% increase	1.6	1.6	1.8	4.3	—3.4	
Birth rate	19.5	21.8	22.6	24.9	26.1 ⁸	
Death rate	19.1	20.7	22.2	22.4	24.4 ⁸	
Rate of natural increase.	0.4	1.1	0.4	2.5	1.7 ⁸	
Marriages	7.9	7.6	7.3	7.5	7.9 ⁸	
Emigrants			119			
Austria—						
Population	28,572	26,151	23,895	22,144	20,218	
% increase	9.2	9.4	7.9	9.5		
Birth rate	33.0	36.7	37.3	38.6	40.2 ⁸	
Death rate	22.2	24.8	28.5	30.7	31.9 ⁸	
Rate of natural increase.	10.8	11.9	8.8	7.9	8.3 ⁸	
Marriages	7.6	8.0	7.7	7.8	8.6 ⁸	
Emigrants	2,017	671	444 ¹³			

TABLE XI.—THE MOVEMENT OF POPULATION, 1860-1910—*Continued*

	1910	1900	1890	1880	1870	1860
Hungary—						
Population	20,886	19,255	17,464	15,739	15,509	
% increase	8.3	10.2	10.9	1.5		
Birth rate	35.9	38.6	42.1	43.4	42.1	
Death rate	24.7	26.9	32.8	32.4	35.9	
Rate of natural increase.	11.2	11.7	9.3	11.0	6.2	
Marriages	9.0	8.8	8.7	9.8	11.1 ¹⁴	
Emigrants. See Austria.						
Spain—						
Population	19,589	18,608	17,545	16,432	16,799	15,655
% increase	5.2	6.0	6.7	—2.2	7.3	
Birth rate	33.2	34.3	36.2	36.7	36.5 ¹⁵	
Death rate	23.9	27.9	31.6	30.6	30.9	
Rate of natural increase.	9.3	6.4	4.6	6.1	5.6	
Marriages	7.3	8.2	7.8	6.5	7.3	
Emigrants	1,061	801	544			
Bulgaria—						
Population	4,329	3,744	3,200	2,008		
% increase	15.6	17.0	59.3			
Birth rate	41.0 ¹⁶	39.6	36.9			
Death rate	24.0 ¹⁶	23.4	23.2			
Rate of natural increase.	17.0 ¹⁶	16.2	13.7			
Marriages	9.2 ¹⁶	8.6	8.6			
Roumania—						
Population	6,966	5,957	5,800	5,300	4,754	4,000
% increase	16.9	2.7	9.4	11.4	18.8	
Birth rate	41.6	39.2				
Death rate	26.6	26.5				
Rate of natural increase.	15.0	12.7				
Marriages	9.7	7.7				
Argentina—						
Population	7,092		3,964		1,803	
% increase	78.9		119.8			
Immigrants	2,231	680	1,014	434	180	
Emigrants	1,007	527	216	165		
Net immigration	1,224	153	798	269		

TABLE XI.—THE MOVEMENT OF POPULATION, 1860-1910—*Continued*

	1910	1900	1890	1880	1870	1860
Uruguay—						
Population	1,043	936	751	438	334	229
% increase	11.4	24.6	71.4	31.1	45.4	
Birth rate	32.1 ¹⁷	33.0	39.5			
Death rate	14.0 ¹⁷	13.5	18.1			
Rate of natural increase.	18.1 ¹⁷	19.5	21.4			
Marriages	6.0 ¹⁷	4.8	5.5			
Immigrants	83	86	150			
Emigrants	62	66	82			
Net immigration	21	20	68			
Japan—						
Population (3)	50,896	44,816	40,719	36,500	33,111	
% increase	13.5	10.0	11.5	10.2		
Birth rate	33.7	31.9	28.8			
Death rate	21.3	20.6	20.4			
Rate of natural increase.	12.4	11.3	8.4			
Marriages	9.0	8.4	8.3			
Italy—						
Population	34,671	32,450	30,536	28,460	26,810	21,777
% increase	6.8	6.3	7.3	6.2	23.0	
Birth rate	32.3	33.3	37.2	36.4	37.4 ¹⁸	
Death rate	21.1	22.6	26.5	28.7	30.2 ¹⁸	
Rate of natural increase.	11.2	10.7	10.7	7.7	7.2 ¹⁸	
Marriages	7.8	7.2	7.6	7.3	7.7 ¹⁸	
Emigrants	5,531	1,487	990	119		

This chapter concludes the compilation of data on the growth of population and food supply. For this reason it will be well to bring some of the results together here in graphic form. The discussion of these results will be found in the following chapter.

For the explanation of the method used in the construction of these graphs, see Appendix B. The logarithms will also be found there. In these graphs equal distances represent equal percentages of rise or fall instead of absolute differences between numbers. For this reason the base line is merely conventional and the curves may be shifted upwards or downwards to make comparisons easy.

¹ The number of people is expressed in thousands throughout this table. In some cases the census years of other countries do not coincide with those of the United States. In these cases a slight shifting forward or backward has been necessary. For all such changes see Appendix A.

² Birth rates and death rates as given here are crude and are averages for five-year periods of which the census year is the median unless otherwise noted. The same is true of marriages and rates of natural increase.

³ The number of marriages per 1,000 of the population is meant. Each marriage involves two persons. These data like those on birth rates, death rates and rates of natural increase are not available for the whole United States.

⁴ Throughout the table the number of emigrants and immigrants as given for a certain year means the total number for the decade of which the census year is the last year.

⁵ This estimate supposes that 1-5 of the immigrants to the United States prior to 1881 returned home and that 1-3 have done so since that time. See *Rep. of the Imm. Comm.* (Washington, 1911), *Abstract*, vol. i, p. 112.

⁶ This number is secured by subtracting the number of immigrants that are estimated to have returned home from the total number of immigrants.

⁷ For the countries of Europe the number of immigrants refers only to those of the nationality of the country from which they are reported as emigrating.

⁸ These are averages for the 20-year period, 1853-72.

⁹ Passengers of British nationality only bound to or coming from countries outside of Europe.

¹⁰ These rates are for the single years 1871, 1881, 1891, 1901, and 1911.

¹¹ An average for the years 1873-76.

¹² Approximate only.

¹³ The no. of emigrants is for both Austria and Hungary.

¹⁴ In 1868 the marriage rate was unusually high.

¹⁵ An average for the years 1866-70.

¹⁶ An average for the years 1907-9.

¹⁷ An average for the years 1907-10.

¹⁸ An average for the years 1863-72.

LEGEND for
Figs. 1-2-3-4-5-6

- Population
- Cereals
- + + + Exports
- - - Imports
- Cattle

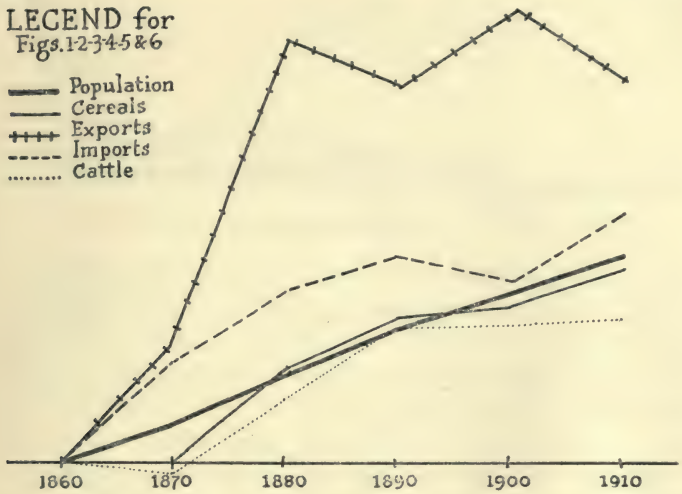


Fig. 1 United States.



Fig. 2 Un. Kingdom

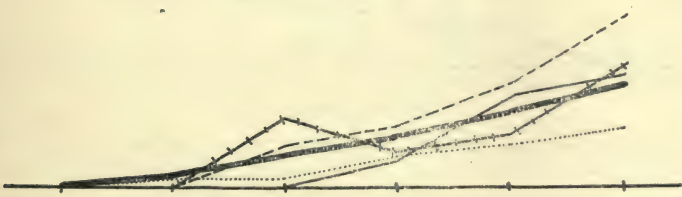


Fig. 3 Germany

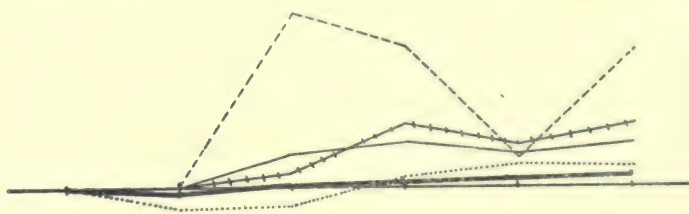


Fig.4 France

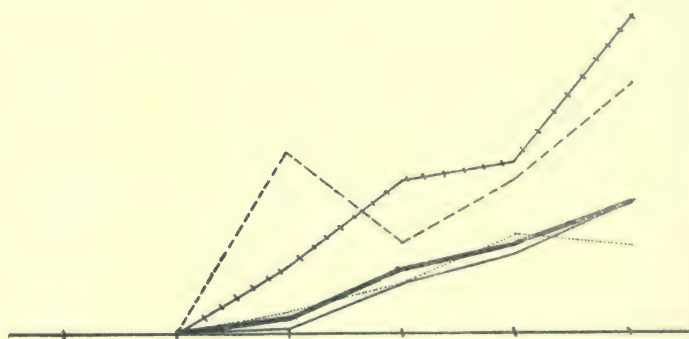


Fig.5 Russia

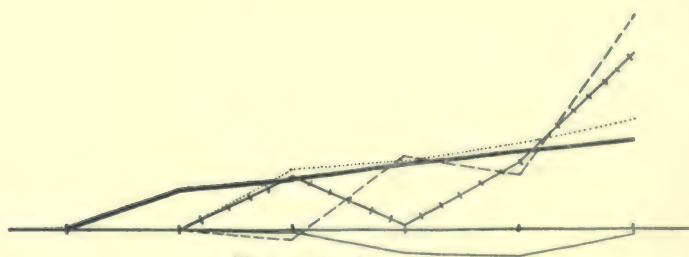


Fig.6 Italy

NOTE: These graphs have been reduced to five-eighths the original size. This should be borne in mind in comparing them with the logarithms from which they are constructed. For the method of construction and the logarithms refer to Appendix B, pp. 175-177. Observe that equal vertical distances on the charts denote equal percentages of rise or fall and not absolute amounts.

CHAPTER IX

THE GROWTH OF POPULATION AND FOOD SUPPLY

THE second proposition which Malthus put forward, and which he considered the most important, was that "population invariably increases where the means of subsistence increase, unless prevented by some very powerful and obvious checks".¹ What Malthus really wanted to prove was that actual pressure on the means of subsistence, and fear of pressure, were the chief causes which kept population from multiplying faster than it did, and that much misery and suffering were due to these causes.² He regarded the rapid growth of population when the means of subsistence increased as proof of these propositions. He looked upon population as a great force gathered behind a movable barrier, which was the food supply. As this barrier was moved ahead and left an open space, population proceeded to fill up this open space. If the barrier were moved rapidly the population would increase rapidly, if it were moved slowly population would increase slowly, and always those close to the barrier would be in distress, and fear of being pressed close to the barrier would keep many others from having as large families as they would like to have. The question is then: Do the data in the preceding chapters throw any new light on the relation between the growth of population and food supply?

The answer to this question is, Yes. In the last few

¹ *Cf. supra*, p. 12.

² *Cf. supra*, p. 14.

decades more complete statistical data afford us a new means of testing Malthus' doctrine. Let us notice some of the countries with varying rates of increase in production of food to see what is taking place as regards the growth of population.¹

In the United States the rate of increase in the production of cereals has been consistently high.² The rate of increase in production of cattle has been high also until the last two decades. Most of the other kinds of food have also been increasing quite rapidly.³ Now, if we examine the rate of increase of population we find that it has been somewhat lower in the last two decades than it was previous to that time. The rate of increase between 1860 and 1870 was 22.6 per cent in spite of the Civil War and the consequent drain upon the country. The rate of increase between 1890 and 1900 seems to have been affected somewhat by the depression of the middle 90's. On the whole, however, it is clear that the greater the increase in the food supply, the greater has been the increase in population. If we study the United States by decades, this seems very plain. Between 1870 and 1880 the increase in the production of cereals was very rapid, as was also the increase in the number of cattle. The value of exports of foodstuffs increased about five-fold during this period, while that of imports increased about 45 per cent. Population increased 30.1 per cent, of which about 4.5 was due to natural increase and the remainder to immigration. An examination

¹ In Appendix B will be found the rate of increase of population, the rate of natural increase, the rate of increase of cereals, the rate of increase of cattle, the rate of increase of exports and imports, and the number of emigrants or immigrants for the principal countries studied above.

² See explanation in Appendix A.

³ Cf. *supra*, chap. vi.

of the rates of increase of these same things in later decades shows that in the United States population does increase rapidly when the food supply increases rapidly and when the rate of increase of food slackens the population does not increase so rapidly.¹

It can, of course, be shown that at any time of very rapid increase in the production of foodstuffs the population of any given country does not at once fill up the gap between its numbers and the rapidly receding barrier. But this is no argument against Malthusianism, because the surplus of food goes to increase the supply of food in some of the older industrial countries, and thus to maintain or increase their rates of population increase. Or if the food surplus is not sent to foreign countries, the surplus population of these countries comes to the food, thus releasing the pressure and allowing the remaining population to expand until the equilibrium is again established. There can be no doubt that this has been the situation in the United States. A rapid increase in the staple foodstuffs, a rapid increase in the growth of population, a rapid increase in quantity of foodstuffs exported and in the number of immigrants coming to this country to stay, all go together. More will be said later of the effects upon the countries from which these immigrants come.

The vital question to us is whether the United States can keep up its rate of increase indefinitely and still offer the good conditions of life which it does at the present time. The exports of foodstuffs from the United States decreased 32.3 per cent in value during the last decade, while its imports increased 41.3 per cent. This indicates that the United States is rapidly approaching the point where it will not be a self-supporting nation. It may be objected that

¹ Cf. Fig. i, p. III.

this is only a temporary condition due to rather poor crops in 1910. This is not the case, however. From 1910 to 1912 the value of imports of foodstuffs into the United States increased 30.6 per cent, while that of exports increased but 13.4 per cent, and the total value of imports of foodstuffs exceeded the total value of exports.¹ This was not the case in 1913, but we shall see later that this is to be regarded as a serious situation.

If one thinks that the imports and exports should be expressed in amounts rather than in value, a reasonable approximation can be made by calculating the percentage of the increase which is due to rise in prices by the use of the index numbers in Chapter III. No endeavor is made here to reduce them to amounts, because it is the tendency which is the important thing in this study, and this can be seen clearly in the increase in value. There can be no doubt that the days of exporting immense quantities of cereals are over for the United States. It is true that the foods imported at the present time are largely luxuries. But how long will this be the case?

If we turn to Russia we find that a rapid increase in production of food has also been accompanied by a rapid increase in population. The chief difference between the United States and Russia, in this respect, lies in the fact that the increase of population in Russia is almost entirely due to natural increase, while immigration is an important factor in the United States. The rates of increase of population for Russia given here are rather misleading, because the census periods are not decades as in most other countries. The increase between 1880 and 1890, which as given here is very large, is really for a period of about twenty years, and so should be reduced to about 14.0 per

¹ *Statistical Abstract*, no. 35, pp. 448, 486.

cent. That for 1900 is for ten years and is correct as it stands, while the last one is for a period of thirteen years. For a ten-year period it should be reduced to about 17.0 per cent. With these corrections made, we see that Russia has a high rate of increase of population throughout the period covered by these data. At the same time the rate of increase of cereals has been very high, with the exception of 1900, when it was only a little in excess of that of the population. At this time the exports of foodstuffs remained practically stationary, only to increase very rapidly when the increase in production exceeded the increase of population by a good margin, as in the last decade. An examination of the facts regarding Russia confirms the conclusions deduced from those regarding the United States. But in the case of Russia the exports of foodstuffs are yet far in excess of the imports, and it will probably be some time before Russia is so given over to modern industrial life that she will be importing food. But with her rapid rate of natural increase we cannot expect to find her remaining for long the granary of Europe as she is at present. The rapid increase in production of food in Russia has been due in large part to the more improved means of cultivation which are coming into use. Russia imported about 2,500,000 roubles worth of agricultural machinery in 1890,¹ while the imports amounted to about 38,900,000 in 1910.² From 1891 to 1900 the total value of agricultural machinery imported was 74,467,000 roubles; in the next decade, 1901-1910, it was 239,247,000 roubles, or over 200 per cent increase in ten years. Thus it is seen that modern methods of cultivation are becoming very important in relation to the increase of food supply in Russia. The effect

¹ Board of Trade, *Stat. Abstract for the Principal and Other Foreign Countries*, no. 29, p. 75.

² *Ibid.*, no. 38, p. 113.

of this increased capacity to produce food has been very marked on the death rate and the rate of natural increase in Russia. In 1890 the death rate was 35.8; in 1910 it was 29.8, or a decrease of six in this period of twenty years. During the same period the rate of natural increase rose from 12.8 to 17.0, or 4.2. This has taken place at the same time that there has been a comparatively large emigration from the country.¹ Besides, the majority of these emigrants have been in the middle-age groups, where the death rate is naturally low. We should expect, then, other things remaining equal, to find a slightly increased death rate among those remaining. But such is not the case. What we do find is a significant falling off in the death rate in a space of twenty years. Not all of this can be attributed to the release of the pressure on food supply, it is true, but in a country where modern measures for the prevention of disease are, for the most part, unknown there can be but little of the fall in death rate attributed to causes other than the release of pressure on the means of subsistence.

Let us next examine the United Kingdom, a country which has not supplied its own food for a number of years. Although the data on production of cereals do not extend very far back, it seems fair to conclude, from the facts on acres of cereals, that the total production decreased quite steadily from 1880 to 1900.² Since 1900 it has increased slightly. The rate of increase of cattle has been diminishing since 1890, and at no point in the period covered by these data has it equaled the increase in population. The rate of increase of population has fluctuated slightly at different periods. In 1880 the rate of natural increase was larger than at any other time. During the decade

¹ See Russia in Appendix B.

² Board of Trade, *Stat. Abstract of the United Kingdom*, no. 42, pp. 178-9. Data on acreage given there.

1871-80 the number of emigrants who went out to stay was quite large, indicating that they were finding opportunities in the colonies and foreign countries. In the decade 1881-90 the number of emigrants was the largest on record. Thus this large rate of natural increase seems to directly precede a period when emigration was very large. On account of this large emigration the rate of increase of population in 1890 was lower than at any other time in the period covered by the data in this study. In the decade 1891 to 1900 emigration was greatly checked, due to the rather dull times then prevalent. During this time the rate of increase of population rose from 8.16 per cent to 9.87 per cent, or 1.71 per cent, only to fall off again when conditions became more favorable for emigration. Coincident with these movements of the population we find the movements of rise or fall in the rate of increase of foodstuffs. *E. g.*, in 1890 we find a relatively low rate of increase of population, the actual production of cereals was greater than in 1900 by 8.7 per cent, and there was a falling-off in value of both exports and imports of food stuffs. This does not indicate a falling off in quantity, however, for the index number for wholesale prices of foodstuffs was 100.8 in 1880 (on the base 100.0 in the year 1871) and only 80.6 in 1890.¹ Therefore, although there was a falling off in value of foodstuffs imported of 4.0 per cent between 1880 and 1890, there was probably an increase in amount approximating 15.0 per cent. Between 1890 and 1900, when the rate of increase of population was raised 1.71 per cent, the production of cereals decreased and the rate of increase of cattle diminished, but the imports of foodstuffs rose 24.9 per cent in value, and this is less than the rate of increase in amount because the index number for

¹ *Wholesale and Retail Prices, Report to the House of Commons, 1903, p. xxxiv.*

wholesale prices of food fell from 80.6 in 1890 to 74.9 in 1900 (on the base 100.0 in the year 1871).¹

In the next decade we find a smaller rise in the rate of population growth accompanied by a large amount of emigration and a slower increase in the value of imports, the amount of which is still further diminished because of the increase in prices.² But we also find that the home production of cereals increased slightly, which would cause the imports of these to increase at a slower rate.³ It may be objected that no account has been taken of the exports of foodstuffs from the United Kingdom and that these percentages show a higher rate of increase than do the imports during the last decade. But an examination of the exports of food from the United Kingdom⁴ shows that they are very small as compared with the imports, and consist chiefly of articles of food imported and reshipped, or imported, manufactured and then reshipped. For these reasons the exports of food from the United Kingdom can be eliminated from consideration without materially affecting the validity of the statements made about the increase in food supply.

The above considerations show that there can be no doubt that an increase in the food supply of the United Kingdom has meant an increase in its population.

We have summarized here in brief form the facts regarding the growth in population and food supply for three countries with somewhat different characteristics. 1. The United States, a country whose agricultural development has proceeded more rapidly than that of any other in the world, and which still has great agricultural possibilities;

¹ *Wholesale and Retail Prices, loc. cit.*

² *Cf. supra*, p. 47.

³ *Cf. infra*, Appendix C.

⁴ *Cf. infra*, Appendix C.

a country where the population has increased by leaps and bounds, and yet has supplied an immense quantity of the staples of food to some of the older European nations; but a country in which we even now find the imports of food increasing very rapidly because of the great development of the non-agricultural industries which has taken place at the expense of its agricultural development. 2. Russia, a country which has recently entered upon an era of great agricultural development and of which the possibilities in this direction are great, probably as great as those of the United States; a country in which the population is increasing rapidly at the present time and in which the rate of natural increase has risen rapidly in the last two decades; a country which is exporting large quantities of the staples of food and imports but small quantities owing to the vast predominance of agriculture over other kinds of industry. 3. The United Kingdom, a country which has long depended upon other countries for much of its food; a country in which population increases at a moderate rate and very largely by natural increase; a country from which the exports of food are negligible and of which the imports are growing steadily because of the increased population and the decline of the practice of agriculture.

Each of these types shows us an increase in food supply and an increase in population. Where we find a rapid increase in food supply we also find a rapid increase in population, where the increase in food is slow the increase in population is slow. We see this from decade to decade in each country, and these facts will be confirmed when we come to consider the increase in food and population in some of the other countries.

There is one country which stands in a class by itself and which should be examined in making a study of this sort. France has had a practically stationary population

for forty years, and it has been but slightly affected by emigration and immigration. An examination of the same data as in the case of the other countries shows that the production of food in France has increased more rapidly than population since 1880, and that the food imported is also increasing more rapidly than the food exported, and exceeds it in amount in the last decade. On the whole, it is clear from comparing France with these other countries that the amount of food consumed per capita has increased more rapidly there than in any other country, with the possible exception of the United States. That it has not been accompanied by a greater increase of population is a unique phenomenon. The reasons for this are not clear. There are economic motives in the background, but it will require a careful psychological study of the French people in order to ascertain the way in which these economic motives are affecting the attitude of the different classes towards offspring. At a later point we shall take account of the economic effects of a stationary population accompanied by a growing food supply.

The United States, the United Kingdom, and Russia represent the types of country which are important in the western world. It is comparatively easy to classify other countries as resembling rather closely one of these three. Germany represents a stage midway between the United States and the United Kingdom, but on the whole approaching the United Kingdom more closely. It is sending out emigrants, its imports of foodstuffs are enormous, and although the exports have increased more rapidly than imports in the last decade, yet these are insignificant in comparison with the imports and represent to some extent imports which are exported, as is the case in the United Kingdom. Most of the countries of western Europe are of the type of the United Kingdom. In these countries the

population shows a moderately high and steady rate of increase, and also of natural increase; there is a slow and diminishing rate of increase in the production of cereals and cattle, a tendency to throw off a portion of their populations by emigration, and a growing dependence upon foreign countries for their food.

Similar to Russia are the newer countries which are either being settled by Europeans for the first time or those which though settled for some time have been thinly populated and have not yet fully adopted the modern methods of agricultural production. These countries, without exception, show a high rate of increase of population (in some countries due in part to immigration), a high rate of natural increase of population, a high rate of increase in production of foodstuffs, and a large excess of exports of foodstuffs over imports. Australia, New Zealand and Argentina are of this type.

The countries of southeastern Europe resemble Russia more closely than they do either the United States or the United Kingdom, although they do not have the agricultural possibilities of Russia and are not large exporters of food. For these reasons they do not show such a rapid increase in their own populations.

The fact which stands out most clearly regarding Italy is that its rate of natural increase has risen over 50.0 per cent since 1870. This has come about through the falling of the death rate from 30.2 in 1870 to 21.1 in 1910. It is clear that the rise in the rate of natural increase beginning about 1890 has been accompanied by a large amount of emigration, especially in the last decade. Of course, many of these emigrants return to Italy, but it indicates that many Italians are finding conditions easier in other countries and by migrating are making conditions in Italy more favorable for those who remain behind. A

consequence of this, as we have seen, is a rapid falling-off in the death rate. This produces a higher rate of natural increase. This falling-off in the death rate is the more noteworthy when we consider the fact that almost all the emigrants are men and women in the age groups where the death rate is low. This means that the age groups in Italy are slightly out of a normal equilibrium, having more old people and children than they should have. There are fewer children being born, it is true, but the size of the families has not decreased. It appears from the data given here that there has been a small but constant decline in the production of cereals in Italy until the last decade, when the increase of cereals was almost double that of population. This decrease is not so significant when we take into account the large and steady increase in the supply of meat which took place at the same time.¹ In Italy, too, we find that fruits and vegetables are a much larger part of the agricultural production than in almost any other country of Europe. But the supply of food in Italy has increased slowly, and as a consequence we find the population of Italy increasing more slowly than in the other countries of Europe with the exception of Spain. But in this last decade, when it is very clear that the increase in production of food has been very substantial and emigration has been very large, we find the highest rate of natural increase and the lowest death rate of any period covered by our study. It is clear, then, that when the pressure on food has been removed somewhat the population of Italy has increased more rapidly than when the pressure was more severe, and because the rate of increase of food supply has been slower than in most of the other countries, the rate of increase of the population of Italy has been slower than that of most of the other countries.

¹ *Cf. supra*, p. 69.

In Hungary we find the situation quite similar to that of Italy. The imports and exports of foodstuffs are not large and may be left out of account. The increase of population has been moderately large for the last thirty years but has diminished somewhat since the number of emigrants has been rapidly increasing. Between 1900 and 1910 the rate of increase diminished about 2 per cent while the number of emigrants increased about three-fold.¹ The rate of natural increase has been high since 1880 when the movement of emigrants began. It is well worth noting, too, that in 1890 and 1900 when the increase in the production of cereals and cattle was high in Hungary the rate of population increase was higher than between 1900 and 1910 when the rate of increase of cereals and cattle diminished. This diminishing of the rate of increase of cereals and cattle was also accompanied by a very large increase in emigration.

An examination of the data of the other European countries confirms the conclusions already obtained. In almost all of them some of the population begins to emigrate, and the rate of natural increase rises and stays high while the emigrants are leaving the country in large numbers. At a time when emigration from a given country is high the rate of increase of its population is lowered somewhat, and the rate of increase of cereals and cattle tends to slacken. But when emigration slackens, as in the northern and western European countries between 1890 and 1900, the population increases slightly faster than at the earlier period. In most of the European countries the more favorable conditions in the new world following 1900 have brought a renewal of emigration and a small falling-off in the rate at which their populations increased. But throughout, the

¹ Austria included.

rate of natural increase has remained high, with a tendency to be higher at the times emigration was larger.

When we turn to the southern and eastern countries of Europe, where the standards of living are decidedly lower than in northern and western Europe, we find that from 1880 to 1890 the emigration was just beginning to assume significance.¹ In the decade 1890-1900, when the emigration of northern Europeans fell off a great deal, we find a very rapid increase in the numbers of Italians, Russians, Austrians and Hungarians who emigrated. At the same time we find that the death rate was materially lowered in these countries and that the rate of natural increase in the last two decades was higher than ever before.

The change in the character of the emigrants from Europe in the last twenty years represents an effort to establish an equilibrium in population. The people from southeastern Europe find migration favorable to their interests when the northern and western Europeans do not.

Modern migration, as all migration, has been largely a movement of population from localities where the conditions of life were hard to those where they were easier, or at least were thought to be easier. But at present we are able to observe the effects upon the growth of the population of the country from which migration takes place and the country to which it goes with an accuracy that has been impossible heretofore. I have shown above that a rapid increase in the food supply has either raised the rate of natural increase or has attracted large numbers of foreigners, thus bringing about a rapid increase of the population in either case. Emigration has had the effect of decreasing the pressure on food supply, and in all cases

¹ The numbers which came to the U. S. can be gotten from the report of the Immigration Commission. In these earlier years most of the emigrants from Europe came to the U. S.

it has been followed by a rise in the rate of natural increase, while the rate of increase of population was lowered but little.

No one denies that in earlier times, when the manner of life was more simple and harsh than at present, the growth in the food supply was the chief factor in the growth of population. But many do deny that there is any such direct relation between these two phenomena at present. In Chapter II, I have shown that some modern economists scout the idea that the pressure on food supply retards the growth of population. They think that we have passed the time when increased production of food is a very important factor in the growth of population. They cite the great advances made in the last few years in the processes of production and maintain that production is increasing so much faster than population that we need have no fear but that from now on we shall have an abundance of food for everyone. I cannot share this view. There are many things which point to the growing difficulty of supplying a rapidly growing population with food.

The data given on Wages and Prices in Chapter III show very clearly that the problem is becoming serious. In 1900 the purchasing power of wages in thirty-nine principal industrial cities, in terms of the retail prices of food, was 100.2 (on the base 100.0 for the years 1890-99). In 1912 this had fallen to 85.3, or a decrease of 14.9 in twelve years. As was pointed out there, the wage data used here are for trades unions only, and probably show a greater increase than the wages of all classes of labor would show. Not all commodities have risen in price as rapidly as food-stuffs, so it would not be accurate to say that wages had fallen 15.0 per cent in general purchasing power. But it is clear that purchases of food are taking a greater proportion of the laborers' wages than they did a few years

ago. There have been many reasons put forth to account for this state of affairs, but it appears probable that one of the most important reasons is that foodstuffs are proportionately scarcer and the same amount of labor is not producing the surplus returns that it formerly did. The operation of the law of diminishing returns will be discussed in the following chapter.

It may seem that undue prominence has been given here to the conditions in the United States. But I do not think that such is the case, because in many ways the development of the United States may be regarded as typical of what we may expect to take place in other countries of great resources which are as yet largely undeveloped.

Let us examine Argentina which, like the United States, is largely in the temperate zone and which has great natural resources. Between 1870 and 1890 the population increased 119.8 per cent, and between 1890 and 1910 it increased 78.9 per cent. These percentages of increase exceed those of the United States in the early years of the last century.¹ If Argentina has, in proportion to its area, as great resources as the United States, we may look for a more rapid development of these than has taken place in the United States. The conditions are more favorable for the development of new lands to-day than they ever were before. Knowledge of opportunities is widely diffused, the means of transportation are excellent and cheap, and capital is available for investment in quantities unheard of only a few decades ago. All of these things make it probable that the development of Argentina and other new countries will surpass even the astonishing development of the United States within the last seventy-five years. But it may be asked: Where will the people come from to colonize these

¹ *Stat. Abstract*, no. 35, p. 41.

new lands? As has been shown above,¹ the increase of population in the countries taken account of in this study was slightly greater between 1900 and 1910 than during any previous decade covered by these data. This means that the rate of natural increase was somewhat larger than at any other time for which we have records. It is true that the birth rates have fallen, but the population is not increasing more slowly. It has also been shown above that where the opportunities for the getting of food increased rapidly, the population expanded to make use of them. We may expect that with the colonization of new lands where the opportunities are good population will expand to make use of them. Besides, we must remember that the population in which growth is going on to-day is almost twice as great as it was fifty years ago.² Therefore, even if the old countries send forth to new lands a much smaller proportion of their people, these new lands will yet be colonized very rapidly—more rapidly than the United States, in all probability. We have seen that the conditions in the United States point to the danger of population increasing so fast that food will have to be imported in large quantities. The question is, then: How long are there going to be lands which will be in a position to furnish this food to us and to the nations of Europe which are already relying largely on imports?

With the rapid colonization of the temperate latitudes, it will not be long that we can look to any foreign country for any considerable part of our food. Just as England has ceased to look to us for much of her food, so must she cease to look to Russia, Argentina, Australia, Canada, and other countries in a comparatively short time. And this time will be made still shorter if the United States becomes

¹ Cf. *supra*, p. 102.

² Cf. *supra*, p. 102.

a large importer. Under modern conditions no nation will long be the granary of another. It is becoming easier for people to go to the food than to bring the food to them.

The conditions which made possible the unprecedented expansion of the European peoples in the last fifty years are passing away. The agricultural development which came as a result of rapid transportation, the invention of labor-saving farm machinery, and the abundance of new and fertile lands cannot be duplicated. The system of transportation can be greatly improved, but no revolution such as came with the development of the steam engine seems likely to take place again. The efficiency of agricultural implements will probably be greatly increased, but they have already reached the limit of practicability for extensive farming—not because the implements might not be improved upon, but because the days of extensive farming are rapidly passing as the new countries become more thickly settled. Fertile land is no longer to be had for the asking in the United States and will soon be taken up in the other places where Europeans can thrive.

CHAPTER X

THE OUTLOOK IN THE LIGHT OF THE EVIDENCES OF THE OPERATION OF THE LAW OF DIMINISHING RETURNS

In view of the fact that the available lands of the world are being so rapidly colonized that no nation can expect to draw a large amount of food from foreign sources indefinitely, the power to produce more food from the land now under cultivation becomes of great importance. If the surplus produce which a man can glean from his land can be increased without limit, we need have no fear that population will increase too rapidly. If, on the other hand, there is good reason to believe that even now the law of diminishing returns is operative in agriculture, the situation assumes a more serious aspect. The inquiry here regarding the operation of the law of diminishing returns will be restricted to the United States. There are two reasons for doing this: (1) the agricultural situation in the United States is relatively good, and if there are any evidences of diminishing returns here we are justified in assuming that we should find still better evidences in most of the older countries and that the newer countries are rapidly approaching the situation of the United States; (2) the data are more available and can be more easily verified.

EVIDENCES OF DIMINISHING RETURNS IN AGRICULTURE

In the decade 1900-1910 the value of all farm property rose from about 20.5 billions of dollars to about 41 billions

of dollars, or, to be exact, 100.5 per cent.¹ In the same period the number of farms increased from 5,737,372 to 6,361,502, or 10.9 per cent.² The average acreage of farms fell from 146.2 acres to 138.1 acres, or 5.5 per cent;³ but the improved acreage per farm rose from 72.2 acres to 75.2 acres, or 4.1 per cent.⁴ During this same period the rural population increased from 44,384,930 to 49,348,883, or 11.2 per cent.⁵ The increase in number of farms (10.9 per cent) and in the rural population (11.2 per cent) is almost identical. Each farm, according to census definition, has a farm operator.⁶ With an operator on each farm and the rural population increasing just slightly faster than the number of farms, it seems a reasonable conclusion that the labor bestowed on each acre of farm land was very nearly the same in 1910 as in 1900. If there was any difference it would seem to be in the bestowal of more labor per acre in 1910 than in 1900, because the number of farms under 20 acres increased 24.5 per cent during the decade,⁷ while the total number of farms increased but 10.9 per cent. It is also probable that in the last decade there was less work not connected directly with the tilling of land for the rural population to do than ever before. The growing concentration of industry has left the rural population almost nothing to do except to tend the farm. Not only has the home industry gone to the cities, but much of the time of the farmer, and the dweller in the small towns which are classed as rural, which was formerly taken up with various repairs, fence-building, *et cetera*, can now be devoted to the better care of crops and cattle. The manufacture of machines with interchangeable parts, of

¹ *Thirteenth Census, Abstract*, p. 265.

² *Ibid.*, loc. cit.

³ *Ibid.*, loc. cit.

⁴ *Ibid.*, p. 265.

⁵ *Ibid.*, loc. cit.

⁶ *Ibid.*, p. 55.

⁷ *Ibid.*, p. 303.

patent devices to facilitate various kinds of work, and the buying of ready-made goods, have all left the farmer freer to give his attention to his crops and cattle. In view of these changes, it seems to me to be a conservative statement to say that the labor time per acre of farm land has at any rate not diminished even though the proportion of the rural population in towns of less than 2,500 inhabitants has increased somewhat. During this same period the value of all farm property per acre in farms increased from \$24.37 to \$46.64, or 91.4 per cent.¹

The question is then: With the same or slightly greater amount of labor time per acre of farm lands and an increase in total capital of 91.4 per cent per acre, what was the increase in production per acre? It may be objected that putting the question in this form assumes the increase in value of land to be a cause of increased production rather than to be a result of the increased value of products. In order to do away with this objection we will take only working capital, which includes implements, machines, and domestic animals. The working capital in 1900 was \$4.56 per acre, and in 1910 it was \$7.04, or an increase of 54.3 per cent.² The question may now be put in this form: The labor time per acre remaining the same or increasing but slightly, and the working capital increasing 54.3 per cent, what has been the increased product per acre? This question can be answered in part by taking the average acreage production of some of the chief crops for a series of years. The *Crop Reporter* for February, 1913, gives a series of diagrams representing the acreage production of some of the chief crops. From these diagrams the following percentages have been obtained: between 1900 and 1910 the increase per acre in

¹ *Thirteenth Census, Abstract*, p. 265.

² *Ibid.*, p. 281.

production of corn was 6.1 per cent; wheat, 7.5 per cent; oats, 9.1 per cent, and potatoes, 7.7 per cent.¹ Thus, in spite of the very rapid increase in capital, the acreage production of cereals increases but slowly. Part of this increase of capital on the farms is due, however, to the general high level of prices and not to the actual increase in the quantity and quality of the means of production. The general level of prices of commodities rose from 110.5 in 1900 to 131.6 in 1910.² This means that 19.0 per cent of the increase in capital³ was due to rise in prices and does not represent an increase in the quantity or quality of the means of production. 19.0 per cent of 54.3 per cent equals 10.3 per cent, and if this be subtracted from 54.3 per cent we have 44.0 per cent, which should represent the actual increase in the quantity and quality of the means of production.

It may still be objected that cattle are included in these means of production and that they should not be. But they are included in both years and allowance has been made for the rise in price, so this objection is not valid. Moreover, the price of metals and implements was 120.5 in 1900 and 128.5 in 1910,⁴ or an increase of 8.0, which is 6.6 per cent increase between 1900 and 1910. This is only

¹ These figures are obtained by taking the average yield for ten years ending with the year given. Thus the yield given for 1900 is the ten year average 1891-1900, and that for 1910 the ten year average 1901-1910.

² *Statistical Abstract*, no. 35, p. 576.

³ It should be noted that the difference between index numbers for given years does not represent the absolute increase or decrease in percentage between these numbers, but only the increase or decrease on the basis of the given index numbers. E. g. an increase of 10.0 in index numbers would represent an increase of 11.1% if the increase were from 90.0 to 100.0.

⁴ *Statistical Abstract*, no. 35, p. 577.

about one-third of the increase in the price of commodities as a whole. Therefore, when allowance is made for the increase in price of all commodities, as was done above, it tends to make the increase in the quantity and quality of the means of agricultural production appear less than it really is. There is good reason to believe, too, that farm machinery has increased less in price than much other machinery. Besides, the increase in the value of implements and machinery used on farms in 1910 was 54.8 per cent instead of 54.3 per cent when livestock are included.¹ Now, if we take 19.0 per cent of this we get 10.4 per cent, which leaves 44.4 per cent as the rate of increase of the instruments of production exclusive of livestock. But the difference between this and the rate when livestock are included is only 0.4 per cent, which is too small to be of consequence.

From the above it appears that the acreage production of cereal and potato crops increased at rates varying from 6.1 per cent to 9.1 per cent during the decade 1900-1910. We will suppose that the average increase was 8.0 per cent, which is a little higher than actually took place. The use of this percentage will make the statements which follow all the more conservative.

During the same period the labor time bestowed on an acre remained almost the same or increased but little, and the instruments of production (livestock included) increased 44.0 per cent in quantity and quality. This shows that it has required a large increase in the instruments of production to bring about a small increase in acreage production when the labor time per acre remains practically stationary and when some new land of inferior quality is coming into cultivation. But perhaps this is a perfectly

¹ *Thirteenth Census, Abstract*, p. 265.

normal state of affairs, and we shall find that the working capital per acre has been increasing at this rate regularly in recent years. Let us examine the same data for the preceding decade, then, before we make deductions from these facts.

The instruments of production (livestock not included) per acre of farm lands increased 12.6 per cent between 1890 and 1900.¹ This might be slightly raised by the fact that the level of prices for all commodities fell 2.1 per cent from 1890 to 1900.² But the price of implements and machinery rose about 1.0 per cent³ during this time, so that the increase of 12.6 per cent would be a maximum increase. If, however, we include livestock on farms in the means of production the rate of increase between 1890 and 1900 is only 1.5 per cent.⁴ Livestock should be included, for during this decade cattle increased in number but 2.0 per cent while horses increased in number 11.0 per cent. Thus the chief increase in livestock in the decade 1890-1900 was in animals used directly in cultivation, as was also the case in the decade 1900-1910, when cattle increased only 3.0 per cent in numbers while horses increased 13.4 per cent.⁵ In the same period, 1890-1900, the corn, wheat, potato, and oats crops showed an average increase in acreage production of about 9.0 per cent (actually a little over 1.0 per cent higher than for the decade 1900-1910).⁶ During this same period, also, the number of farms increased 25.6 per cent and the number of acres per farm increased about 7.0 per cent,⁷ while the rural popu-

¹ *Thirteenth Census, Abstract*, p. 281.

² *Statistical Abstract*, no. 35, p. 576.

³ *Ibid.*, no. 35, p. 577.

⁴ *Thirteenth Census, Abstract*, p. 281.

⁵ *Id.*, *supra*, p. 65.

⁶ Dep't of Agriculture, *Crop Reporter*, Feb., 1913.

⁷ *Thirteenth Census, Abstract*, p. 281.

lation increased only 12.3 per cent.¹ This would indicate that some of the labor on the farms in 1890 had gone to the cities by 1900. The people who moved to the cities did in the factories there some of the work which had been done on the farms in the earlier period, thus leaving the farmer freer to devote his time and thought to the cultivation of his fields and the care of his cattle. It seems quite likely that the actual labor time per acre was lowered considerably in the earlier stages of the movement of population from the country to the city. It would seem, then, in view of the slow increase in rural population during this decade (1890-1900) in comparison with the rapid increase in number of farms—the increase in number of farms being about twice that of the rural population—that in all probability the labor time per acre cultivated was less in 1900 than in 1890.

When we come to contrast these two decades we find that they are alike in only one respect, viz., that during both of them the acreage production of potatoes and cereals increased. In the earlier period the amount of labor time per acre probably decreased, while in the later period it remained about stationary. In the earlier period the value of the means of production (livestock included) increased about 1.5 per cent, and 12.6 per cent if we do not include livestock. In the later period they increased 44.0 per cent whether livestock are included or not. In all cases due allowance has been made for the variations in prices, so that these percentages should represent the actual increase in quantity and quality of the means of production. As said above, the greatest increase in livestock was in horses. We should, therefore, use the percentages with livestock included in order to get a fair picture of the changes which are taking place.

¹ *Thirteenth Census, Abstract*, p. 55.

In view of these differences, it seems impossible not to conclude that the law of diminishing returns has commenced to operate strongly in the agriculture of the United States. It cannot be urged against this conclusion that the seasons were more favorable in the earlier period than in the later, for such was not the case. The conditions between 1900-1910 were generally better than they were in the earlier period, as will be recalled by those who were familiar with them in the middle west during both decades. The chief difference is that in the earlier decade there was still some land of excellent quality coming into cultivation, while in the later decade much of the land which was being brought into use was of a decidedly inferior quality. With the adding of poorer and poorer land to the farms of the nation we should expect that the cost of production of a given quantity of produce would increase, and these data bear out this expectation. When there is an abundance of good land, a small increase (about 1.5 per cent between 1890 and 1900) in the instruments of production will not only make up for a decrease of labor time per acre, but it will also increase the average acreage production during a decade in which there are several bad seasons. But when the land coming under cultivation is of an inferior quality, it takes the same amount of labor time per acre and a large increase in the means of production to increase the acreage production at a slightly slower rate. There can be no doubt that each year land is being used for crops which was regarded as useless only a few years ago. At present this land must be cultivated in an extensive manner in order to make it profitable. This means that a large amount of capital is required and that farms shall be large; *e. g.*, in North Dakota the farms increased in size from 277.4 acres in 1890 to 382.3 in 1910, and the value of machinery and implements (livestock not included) from

\$241 to \$590 per farm.¹ The same is true in varying degrees of most of the other states in the western part of the Mississippi valley and of those farther west.² This means that there are vast areas which are yielding comparatively small returns, and thus the average is kept low. For this reason some people would say that the percentages of increase in acreage yield given above are too low and do not represent the actual rate at which acreage increase in production is taking place.

But there are several reasons why this is not the case. In the first place, we must take into account this poorer land as well as the more fertile when we are trying to ascertain the prospects for future development. Some of the better land may produce an increased acreage yield of 20 per cent or more in the space of a few years with a rather small increase in the implements of production, but there are also poorer lands which will not yield more than two or three per cent increase in the same length of time with a large increase in the efficiency of the means of cultivation. For this reason the average increase in acreage production is the fair measure of what has taken place and the fair basis of any estimates of what may take place. In the second place, there seems to have been a tendency to exaggerate the favorableness of the agricultural conditions in the United States on the part of the late administration of the Department of Agriculture. To what extent this operated it is impossible to say, but if one were to estimate the average increase from the census reports the conditions appear much less favorable than the data used here indicate. *E. g.*, according to the census reports, not since 1890 has the production of cereals increased as

¹ *Thirteenth Census, Bulletin: Agriculture*, No. Dakota.

² *Ibid.*, other states.

fast as the acreage. This indicates that there was actually a decrease in acreage production in the last two decades.¹ But it can be fairly urged against this conclusion that the census years are not always typical years and any attempt at an average must be based upon the estimates by the Department of Agriculture which we have already used.

It might also be urged that the rate of increase in acreage production of cereals is not a proper measure of the rate of increase in acreage production of other articles of food. There is some force to this objection, but not enough to make it of much importance. The fact is that cereals and meat are yet the staples of diet in the western world. An examination of the tables in Chapter VII and Appendix C, showing the imports and exports of foodstuffs, indicates that the imports of grain and meat in the older countries are very large, and they do not seem to be losing their relative importance. Of course, the imports of tea, coffee, spices, nuts and fruit are large, but only the last two of these have sufficient food values to make it likely that they could supplant cereals and meat. When we inquire how large a part fruit is filling in the diet of a nation, we cannot but conclude that it is not supplanting the staple articles of diet among any considerable part of the population. We saw in Chapter VI that the fruits and nuts of the United States are increasing quite rapidly, especially the subtropical fruits, but we also saw that the growing concentration of various kinds of agriculture was bringing about an increasing completeness in the census returns and that the rise in prices must be considered when we are trying to ascertain quantities from values. Even though it seems likely that the increase in production

¹ The census data show that there was a decrease of 1.5 bu. in the acreage production of all cereals between 1890 and 1910. See Census Reports on Agriculture for 1890, 1900, and 1910.

of fruits proceeds somewhat faster than the increase in population, it is not probable that the use of these fruits lessens the quantity of staples used. If we turn to the imports of fruit into the United States we find that out of a total value of imports of foodstuffs exceeding \$426,000,000 in 1912 only about \$30,000,000 was spent for fruits.¹ This is approximately 7.0 per cent of the total and is about 1.0 per cent lower than in 1902.¹ Thus it does not seem that there is any good reason to maintain that fruits are becoming a staple of diet in the United States. It is true that the quantity of bananas imported is increasing rapidly.² But when the total supply imported is less than one-half bunch per capita,³ it would certainly be folly to maintain that bananas were filling any large place in the diet of the American people.

In the United Kingdom the total value of imports of fruits and nuts in 1912 was about £16,000,000, or about 6.0 per cent of the total value of imports of foodstuffs. This is an increase of about 1.0 per cent in the proportion which the value of the fruit and nuts imported bore to the value of all foodstuffs imported in 1898.⁴ The imports of bananas amounted to only one-seventh bunch per capita in the year 1912.⁴ From these data it would appear that in the United Kingdom fruit is even less important in the diet of the people than in the United States.

What was said in Chapter VI regarding the increase of vegetables and garden-truck in the United States will also apply to most of the highly industrial countries of Europe.

¹ *Statistical Abstract*, no. 35, pp. 448, 462.

² *Ibid.*, *loc. cit.*

³ *Ibid.*, *loc. cit.* Also *cf. supra*, chap. viii for population.

⁴ Board of Trade, *Stat. Abs. for the United Kingdom*, no. 60, pp. 133, 134.

The population has been growing more and more urban in all of the countries of western Europe, and the man in the town has gradually found land values too high to make his garden profitable, and even where there was land the town life has disinclined him to keep his garden. The result is that even though the large variety of vegetables and garden stuffs which is found in the city markets leads one to believe that these are becoming more and more important in the diet of the masses, yet it is quite likely that they are furnishing proportionally a smaller part of the national food supply than when the population was more largely rural. There are no data to support this contention, it is true, but common observation leads one to believe that this is the case. It seems a natural consequence of the large cityward migration.

There is, of course, a difference between the diet of the well-to-do and that of the other classes. The well-to-do are, perhaps, substituting luxuries of various kinds for the staples to a certain extent. The well-to-do are, however, only a small proportion of the whole population even in the United States, where they are probably more numerous than in any other country. But when we think of the great body of people in Europe and America, we cannot but conclude that cereals, meat, potatoes, and pulse are almost the only substantial articles of diet of these people. Among the rural populations vegetables are used to some extent in the place of cereals, but for the most part the food value in them is not large and cereals are found more satisfactory.

In view of these considerations it is legitimate to look upon the increase in production of cereals, meat, potatoes and pulse as a fair index of the growth of the food supply upon which the vast majority of the people live.

If we assume that the percentages given above represent the real condition of our agriculture and that with the ex-

penditure of the same amount of labor time per acre and with an increase of 44.0 per cent in the quantity and quality of the instruments of production (livestock included) we get but an 8.0 per cent increase in acreage yield in a decade, we can easily see how hard it is going to be to double the acreage yield. *E. g.*, if the average acreage yield in this country is now 25 bushels for cereals and pulse, it will take ninety years to double it with an increase of 8.0 per cent every ten years. In the same period the instruments of production would be increased to about twenty-six times their present quantity and quality per acre, or in terms of money from \$7.04 (their present value per acre) to \$187.05 per acre. This is about four times the present value of all farm property per acre (including the land).¹ These percentages of increase probably do not represent with absolute accuracy the ratio at which production and the instruments of production are increasing on the farms, but it seems to me they do show clearly that under present conditions it is going to require an enormous outlay of capital to greatly increase the acreage production.

Of course, it will be urged that scientific farming will enable us to increase the acreage production indefinitely and will require but little addition to the present instruments of production. But even though the spread of knowledge, which is the essential thing in scientific farming, may take the place of a certain amount of the instruments of production, it is doubtful whether in the long run the knowledge is more economical than the implements. Scientific farming means intensive farming, it means the application of more time to smaller areas in the hope of producing greater crops for a given amount of labor. How successful this will be remains to be seen. At the

¹ *Thirteenth Census, Abstract*, p. 281.

present time intensive cultivation has concerned itself with special crops for the most part. There is no good reason to maintain that intensive cultivation will not have somewhat the same effect on staple crops, but it is too soon yet to say much about this aspect of the movement. It seems doubtful, however, whether scientific farming will be sufficient to put off the action of the law of diminishing returns for any great length of time. It seems merely to point the way to supporting a much larger body of people on the same area of land and does not point to any enduring increase of the surplus from the labor of each person.

Let us see, then, whether we can get any general notion of what intensive agriculture has to promise. In the United Kingdom the acreage production of cereals and pulse has increased but 8.0 per cent in the last twenty-five years.¹ This indicates clearly that it has been found easier to import cereals and pulse than to attempt to increase the acreage production. Extensive agriculture has been found cheaper than intensive. It is going to cost a great deal more to add a few bushels to the acreage production when this becomes necessary than it is at present to add the necessary number of bushels to the total quantity through the extension of the area of cultivation. It must be recognized, of course, that capital is not so fluid that it can pass from one industry to another altogether freely, and also that there are many social factors at work to keep agriculture from developing as it might if more attention were given to it. But these factors are not sufficient to account for the fact that the increase in acreage production is but a small fraction of the total increase which has taken place. The chief reason for this is that agricultural production has more quickly reached the stage of diminishing returns than the non-agri-

¹ Board of Trade, *Stat. Abs. for the United Kingdom*, no. 42, p. 182, also no. 60, p. 343.

cultural industries, and that the most obvious way to escape the operation of this law is to bring new and fertile land into cultivation. This conclusion is borne out by the rough approximation to acreage yield as given in Table XIV in Appendix C. Between 1870 and 1890, when new land of excellent quality was coming into use in the newer countries and when the modern implements for cultivation were much fewer than they are to-day, the increase in acreage production was larger than between 1890 and 1910, when the better quality of unused land was more scarce and when the farm machinery was of a decidedly better quality.

An examination of the increase of the number of acres under various crops and of the increase of the yield of the crops in the more thickly populated countries of Europe, will also convince one that the yield of these staples per acre has increased but little. If in connection with this we examine the imports and exports, there can remain no doubt but that the increase in acreage yield has not been an important factor in the increase of the food supply in the various nations.

It seems, then, we must conclude that intensive agriculture offers but little consolation to the great industrial nations of to-day. The populations of these nations are becoming more and more urban. The proportion of the rural population to the whole is constantly decreasing. The only reason that this could go on as it has is that undeveloped countries in which agriculture offered the best opportunities have been opened up at an amazingly rapid rate and have traded their large surpluses of food for the implements and machinery and other manufactured articles which the industrial nations had to offer. These undeveloped nations, as we have seen, will soon reach the point where they cannot export food if their populations increase as rapidly as that of the United States. These

facts clearly indicate that the present rate of increase of population cannot continue if the urban population, engaged in non-agricultural industries, is to continue to claim the greater part of the increase.

EVIDENCES OF DIMINISHING RETURNS IN OTHER INDUSTRIES

There are those who will grant that the stage of diminishing returns in agriculture is soon reached who deny that the same is true of manufacturing. These men maintain that the increasing returns in the non-agricultural industries will more than offset the diminishing returns in agriculture, and so there is no reason to fear that we cannot have a large and continuous increase in population accompanied by a steady rise in the standard of living. If this is the case, we should expect these rapidly increasing returns to show in two ways. In the first place, the purchasing power of the wages of labor should rise if the same or greater proportion of the products goes to the laborer now than formerly did. In the second place, if a smaller proportion of the product goes to the laborer than formerly, we should expect to find that the exports of the nation per capita have been greatly in excess of the imports in recent years and that this excess production has been turned directly into capital and would show itself ultimately in the per-capita wealth of the nation.

We have already seen that the purchasing power of the wages of labor has not risen in recent years, but has fallen.¹ We cannot but conclude, then, that the increasing returns from manufacturing, if they do exist, have not, during the last decade, manifested themselves in the greater purchasing power of the wages of labor.

Let us turn now to examine the other places where these returns would be likely to go. If our exports per capita

¹ Cf. *supra*, p. 45.

have steadily and increasingly exceeded our imports in recent years, we should expect that this would show itself in the amount per capita of the real and personal property in the United States.¹ In 1890 the excess of exports over imports for the United States was \$0.89 per capita. By 1900 it had risen to \$6.85 per capita.² Since the general level of prices changed but little during this period, this increase probably represents a real gain in surplus production (for wages rose slightly). Since 1900 industry has been moving rapidly, and one would naturally suppose that we would have a larger per-capita surplus to export than formerly. As a matter of fact, however, the per-capita value of exports in 1912 exceeded that of imports by only \$5.44.³ In this period (1900-1910) the index number for prices of all commodities had risen 21.1 points, or 20.0 per cent. Now, if we estimate the quantity of goods exported, we find that there was a falling-off of 36.5 per cent in per-capita exports between 1900 and 1912. For this reason we cannot say that the increased productiveness of industry is giving us a greater per-capita surplus to export. Supposing, then, that there is an increasing per-capita surplus due to the operation of a law of increasing returns in the manufacturing industries, it should either show itself in the per-capita increase in the instruments of production or in the increased consumption of goods by the small class which controls them. For if it shows itself in land values, it merely means that money value is created without a corresponding increase in the efficiency of the means of production.

¹ For this would mean that an increasing proportion of the surplus from industry was in the control of a comparatively few men who would be apt to use this surplus for further production.

² For data on imports see United States, *Statistical Abstract*, no. 35, p. 448; for data on exports, *ibid.*, p. 486.

³ United States, *op. cit.*, no. 35, p. 486.

The per-capita wealth of the nation increased 12.4 per cent between 1890 and 1900.¹ This includes only real and personal property. Not a great deal of it can be attributed to increase in land values, for farm lands increased in value only about \$4,000,000,000 during this time,² and this represented new land, for the value of land and buildings per acre actually fell. It is also doubtful whether real property in the cities increased excessively in value during this period. The cities were growing rapidly, it is true, so land values undoubtedly increased, but they did not increase nearly as rapidly during this decade as during the following one. It seems probable, then, that the increase in per-capita wealth during this decade represents, for the most part, an increase in real productive values.

The per-capita wealth of the country undoubtedly increased more between 1900 and 1910 than during the previous decade. Between 1900 and 1905 it increased 13.2 per cent.³ The data are not yet available for 1910, but assuming that the same rate of increase continued between 1905 and 1910 as for the previous five years, the rate of increase in the per-capita wealth for the decade would be 26.4 per cent. But this does not represent a net increase in productive values to the same extent that the increase in the per-capita wealth between 1890 and 1900 does; *e. g.*, the farm lands of the United States doubled in value per acre in the last decade.⁴ Eighteen billions of dollars is probably a conservative estimate for the increase in wealth due to the increase in farm land values alone, and so does not represent any increase in real productive values. (This

¹ *Statistical Abstract*, no. 35, p. 738.

² *Thirteenth Census, Abstract*, p. 281.

³ *Statistical Abstract*, no. 35, p. 738.

⁴ *Thirteenth Census, Abstract*, p. 281.

estimate still allows about two billions of dollars for improvements and new lands). According to the census report of 1908, the value of real property in the cities having over 30,000 inhabitants was 23.5 billions of dollars.¹ To this at least a billion should be added for the rise in land values between 1908 and 1910. 3.5 billions more should be added for undervaluation of real property, for in Chicago alone the undervaluation amounted to 85 per cent of the total.¹ This brings the total valuation up to 28 billions for these cities, or about \$1,000 worth of real property for each person living in these cities.² Besides this there are about 14 million people in the United States living in cities having from 2,500 to 25,000 inhabitants, and the valuation of this property is not included in the above estimate. If real property in the large cities is worth \$1,000 per capita, in the smaller cities it is worth at least \$300 per capita, or slightly over 4 billions of dollars. This would bring the total value of real property in cities of over 2,500 inhabitants to approximately 32 billions of dollars. This is a very conservative estimate, for cities of between 25,000 and 30,000 inhabitants are not taken into account at all. It is also conservative because there is good reason to believe that land values in the cities increased almost as rapidly as they did in the rural districts, and we are only going to make a deduction of 25 per cent for increase in non-productive values. This deduction amounts to 8 billions of dollars.

The capitalization of manufacturing plants increased from about 10 billions of dollars to about 18.5 billions in this decade;³ the capitalization of the railroads from

¹ *Bureau of the Census, Statistics of Cities*, 1908, p. 274.

² *Thirteenth Census, Abstract*, p. 60.

³ *Ibid.*, p. 439.

about 11.5 billions of dollars to about 19 billions.¹ It does not seem unreasonable to suppose that of this increase in capital of 16 billions of dollars in manufacturing and transportation, at least 2 billions were due not to real increase in productive instruments but to the methods of capitalization used.

At the rate of increase assumed above there would be 48 billions of dollars added to the total of national capital between 1900 and 1910. But if we subtract from this the sums given above which cannot be properly regarded as productive values accumulated from the returns of industry, we find that instead of the 48 billions of dollars increase in total capital, we have but 20 billions, which represents much more nearly the true addition to the productive wealth of the nation. But lest it should be thought that these deductions are too large, it may be noted that the general level of prices was about 20.0 per cent higher in 1910 than in 1900. This means that one-fifth of the total increase in personal property was due not to the increase in the quantity of productive goods but to rise in prices. But no subtraction will be made for this rise in prices, and we shall assume that 20 billions of dollars represents the true increase in productive goods for this decade. When the per-capita wealth of the nation is calculated on this basis, it is found that the increase for this decade is about 0.7 per cent. In making these deductions care has been taken to be conservative, in order that a fair comparison can be made between the decade ending in 1900 and the decade ending in 1910. Of course there were fictitious values in 1900, but the deductions made above for 1910 allow for fictitious values in this decade to as great an extent as they existed in 1900.

¹ *Statistical Abstract*, no. 35, p. 313.

In view of these considerations, one cannot but ask: What has become of the surplus wealth which should be accumulating as the result of industry if the law of increasing returns is strongly in operation in the non-agricultural industries? If the answer is that it has gone into consumption goods instead of productive goods, then we must conclude that the well-to-do classes have consumed them, for the most part, for the laboring classes have not. If the answer is that it has been given to the laborer in the form of fewer hours of labor per day, and that therefore we should not base index numbers for wages on wages per week but on wages per hour, we must conclude that the non-agricultural industries are not yielding increasing returns in such a ratio that a progressive standard of living for the laborer can be supported. This being the case, the rate of increasing returns is slower than is often claimed. If the answer is that the well-to-do are really consuming this surplus, then we must also conclude that the surplus is not large and that it will not go around. The well-to-do class as measured by the income tax is not large—not more than about 2.0 per cent of the population which should be at work (20,000,000). We must conclude, then, that the increased productiveness of labor is not so great as is generally supposed. In the earlier stages of the development of the present industrial system the returns from industry were greatly augmented. But in recent years these returns are harder to augment. It requires a greater expenditure of capital in conjunction with the same amount of labor to increase the output now than it did a few decades ago. This can be shown by an examination of the value added to the raw materials in the process of manufacture in proportion to the labor expended and the capital invested.

If all manufactures are taken as a whole, we find that in 1880 for every dollar of value added to the raw materials

in the process of manufacture \$1.89 was either invested as capital or paid out as wages; in 1900 this had risen to \$2.15, or 13.7 per cent, and in 1910 it had risen to \$2.56, or 19.0 per cent, in the last decade, as against 13.7 per cent in the twenty years prior to 1900.¹ This comparison will perhaps be more significant if we separate capital and wages. In 1880 for every dollar of value added to materials in the processes of manufacture, \$0.48 was paid out as wages; in 1900 this had fallen to \$0.411, or a decrease of 14.3 per cent.¹ In 1910 this had still further fallen to \$0.40, or a decrease of 2.6 per cent.¹ Thus showing that the value of labor per dollar of value added to the materials in the process of manufacture fell much more rapidly in the twenty years preceding 1900 than between 1900 and 1910.¹ At the same time the amount of capital invested per dollar of value added to materials in the process of manufacture increased from \$1.41 in 1880 to \$1.73 in 1900, or 22.7 per cent, while it increased to \$2.16 in 1910, or 25.4 per cent between 1900 and 1910.¹ Thus the increase in capital invested was greater in the last ten years than in the preceding twenty years, and at the same time the amount paid in wages per dollar of value added decreased much more slowly in the last decade than in the preceding twenty years.

The significance of these facts is still more noteworthy when the differences between the industries included prior to 1910 and those included in 1910 are taken into account. In 1900 factories and hand and neighborhood industries were included in the census reports; in 1910 the data were gathered in such a way that hand and neighborhood industries could be separated from factories. The data used here for 1900 include factory and hand and neighborhood in-

¹ *Thirteenth Census, Abstract*, p. 439.

dustries. In 1910 the data are given for factories only. Inasmuch as the work in factories is more standardized and the proportion of it done by machines is greater, we should naturally expect that there would be a considerable reduction of the ratio of the labor cost to the value added to the products in the processes of manufacture when hand and neighborhood industries are not included as is the case in 1910. The fact that only a small reduction took place indicates that it is becoming increasingly difficult to reduce this ratio even when the instruments of production are increasing rapidly.

If it is objected that no account is taken of the rise of wages in recent years, the answer is that prices have also risen. This means that while a dollar will not buy the same quantity of labor now that it would twenty years ago, a dollar of value added now in the processes of manufacture does not represent so great a value (in quantity and quality) as it did twenty years ago. In fact, prices have risen faster than wages, and so it is likely that a dollar purchases a proportionally greater amount of labor to-day than a dollar spent for merchandise.

To prove that the increasing returns of manufacture will offset the diminishing returns of agriculture, it is necessary to prove that manufacture will yield enough surplus to replace the tools now in use with better and better tools, that there will be a greater and greater surplus product for consumption and that a smaller and smaller number of men can do this. Up to the present, one cannot but feel that the great gains in wealth due to manufacturing have been brought about rather by the accumulation of a small surplus from the labor of a constantly increasing proportion of the population engaged in these industries than by any growing excess from the work of each person. Besides, one cannot but wonder whether an

accurate system of cost-accounting in a factory is really representative of the total cost of manufacture of the given product. How much of the cost of maintaining great cities, of a complicated banking system, of an intricate railway system, and of the general costs of living in a highly civilized state are computed in the wages and other items included in the cost accounts of a factory? Have we a right to say that modern industries are working in a stage of increasing returns until they prove the capacity to absorb all these super-charges, the necessity of which they created? I will only suggest an answer to these questions. It seems to me that a system of accounts which deals only with costs at the factory is good as far as it goes, but that it does not go far enough. There is an effort on foot now to compel employers to include in the costs of their businesses charges for injuries to workmen, old-age pensions, *et cetera*, which have heretofore fallen chiefly on the person affected and those dependent on him. It is only gradually that we become aware of the costs of a rapid change in our industrial life and begin to feel that, because these costs have not fallen directly on the industries which created them, the surplus from these industries has been over-estimated.

Since this is the case, even if it could be clearly shown, according to our present method of computing costs, that the returns to an hour of labor have been greatly increased, it would still remain a question whether some of what we call the "high cost of living" is not directly the result of this industrial system; whether our slums should not be charged to it; whether the bonded indebtedness of political units has not been necessary because of the failure of modern industry to meet its legitimate obligations; and, finally, whether the present social unrest, in all its manifold forms, is not due to the lack of understanding which the

directors of this system have shown? These things, and many other things which have not been enumerated, which may collectively be called the costs of progress, have not yet been included in the costs of our industry. If they were included as costs of our industry, by which many of them have been created, where would the increasing returns be found?

We are arranging to hand down to future generations a part of the burdens which our present system has created. We do this on the theory that we are building surely and that we are really solving problems once and for all. Now, if man is going to work in a stage of constantly increasing returns, as many optimists assert, we may expect that the industrial revolutions of the future will be as great as the one we have just experienced. If this proves to be the case, there will be new problems created, which will have to be met by coming generations, as great as those we are meeting, and they will have to meet them saddled with the burdens which we are preparing for them. But if we are to have a slower and more continuous development of industrial life, as seems more probable, then where are future generations to get the surplus to help them take care of their problems if we cannot produce that surplus under present conditions?

CHAPTER XI

SUMMARY AND CONCLUSION

THE CONDITION OF THE LABORER

In the United States we have seen that the working man is already being compelled to take smaller wages, measured in terms of food, than he received a few years ago. The pressure upon food has begun to be felt in this country where conditions have been very good until the last few years. Is this also the case with the European countries? For the United Kingdom we can answer this question definitely. Table III on page 49 shows clearly that wages will purchase about 8.0 per cent less food in 1910 than in 1900. The decrease is not quite so large as in the United States but it is more significant, because the English laborer was nearer the subsistence level in 1900 than the American laborer. That the pressure is being felt in the United Kingdom is also attested by the fact that immigration was much larger in the decade 1900-1910 than in the previous decade. There can be no doubt that the British laborer is being affected by the fact that a larger and larger proportion of his food comes from foreign lands and is increasingly difficult to obtain.

We do not have the data here regarding wages in Germany, but there is good reason to think that the situation of the laborer in Germany is similar to his situation in the United States and the United Kingdom.

In France, where we have data for both wages and prices, we find that the situation is not so serious as in

these other countries. Prices have increased in the last decade, but not as much as in the United States and Germany, and just about the same as in the United Kingdom. Wages have increased faster than prices for most of this decade. Thus it is evident that the situation of the French workingman is better to-day than it has been in the past. As far as our data permit of generalization, we can say that France is the only country in which wages have kept ahead of prices since 1900. What are the differences between France and these other countries which will account for this relatively better situation of the French workingman? By no means the only one, but perhaps the most important one, is that during the last few decades, when the productive power of man has been increased more rapidly than at any other period in history, the French people have increased in numbers very slowly. This has enabled the Frenchman of the lower classes to enjoy more of the fruits of the increased productiveness of modern industry than would have been possible if his numbers had increased more rapidly.

This high state of welfare is not confined to the better classes of workingmen, as is apt to be the case.¹ Many writers and travelers seem to think that the laboring classes as a whole are better off in France than in any other country.²

In addition to the restriction of population, the fact that a larger proportion of the population of France than of

¹ George, *France in the Twentieth Century* (London, 1908), pp. 243-63, also Prothero, *The Pleasant Land of France* (London, 1908), pp. 25-92.

² Lynch, *French Life in Town and Country* (New York, 1902), *passim*, also Foncin, *Le Pays de France*. Edited by Antoine Muzarelli (New York, 1902), *passim*. This view is confirmed by talking with people who have spent enough time in France to know conditions well.

most of the great industrial countries is engaged in agriculture will help to account for the state of general well-being among the masses of the French people. France has not attempted to compete for industrial and commercial supremacy, and therefore has avoided the costs of this competition. It is only within a few years that these costs have come to be felt keenly in the United States and Germany; they have been felt for a longer time in Great Britain.

These three large industrial countries show the characteristics which Malthus thought would be shown where there was a rather rapid increase in population. There are classes in all of these countries which are poverty classes and are fast becoming pauperized. The nations which are trying to furnish the subsistence for a population of indefinite size by the increase of their manufacturing productivity are finding that their people, on the whole, are not so comfortable as those of France. France is developing its industrial life rather slowly and is preserving a balance between the non-agricultural industries and agriculture, between population and production of food, which enables the masses of its people to maintain a progressive standard of living.

Malthus said that if preventive measures were not adopted population would press on the food supply, and misery and vice — the positive checks — would come into operation. France then, instead of refuting Malthus' doctrine of population, is merely an illustration of what takes place when preventive checks are practiced. Its population has been kept well within the means of subsistence and is reaping the results in increased comforts, while those nations where population has tended to outrun the means of subsistence are finding that they have a large misery class to deal with. This misery class is diminishing very slowly in the ratio it bears to the whole population if it is

diminishing at all. There can be but little doubt that in the United States it is larger now than ever before. The immigrant population from foreign countries is at least preventing its decrease, and probably is causing an increase.

Thus it seems that those countries which have been the first to utilize their natural resources in accordance with modern methods are coming to feel the pressure of population on the means of subsistence just as those older countries which have not adopted modern methods of economic production have felt the pressure for a long time. Modern methods increased man's capacity so greatly at the outset that many men were led to believe there could be no more restriction of population due to lack of food. The present condition of the laborer in some of the most advanced industrial countries shows that this is not true.

COMPETITION OF STANDARDS OF LIVING AND MALTHUSIANISM

It is a phenomenon very generally observed that where peoples of different standards of living, whose cultures are not too widely different, come into contact, those having lower standards of living supplant those having higher standards.¹ In the United States this is taking place. The immigrant is supplanting the native population in those parts of the country where they come into contact. In Massachusetts calculations have been made for the birth rate of the old native families.² It is calculated that if it were not for the high birth rate of the immigrants the rate of natural increase would be 1.16 instead of 10.4.³ This figure needs some correction on account of the greater fecundity of native stock in other parts of the state than in Boston. For it was

¹ Thomas, W. I. "The Prussian-Polish Situation: An Experiment in Assimilation," *A. J. S.*, vol. xix, no. v, pp. 624, 625.

² Massachusetts, *Registration Report*, no. 70, pp. 141-6.

³ Cf. *supra*, p. 105.

on the basis of data obtained in Boston that these calculations were made. After making mention of these needed corrections, the report concludes: "But after all corrections have been made, the fact will stand out clearly that the growth of Massachusetts is not due in any great degree to the old, native stock".¹ An examination of the rates of growth of population in those New England states where immigration is not a large factor, confirms the conclusion that the native stock is increasing slowly — much more slowly than the immigrant stock.²

The Registration Reports of Maine show that the rate of natural increase is low, the average for the years 1903-11 being 6.05.³ They also show that the immigrant population is increasing faster than the native population. The number of marriages of people of native stock was 71.8 per cent of all marriages for the period 1907-11, while the average number of births of native parents was 59.7 per cent of the total number of births for the same period.⁴ In 1895 the number of marriages of native persons was 74.0 per cent of the total, while the number of births of native parents was 63.05 per cent of the total number of births.⁵ These data show clearly that the native population is giving away before the immigration of peoples of lower standards of living.

It is sometimes urged that this is a natural phenomenon which has its basis in the physiological changes which take place with increased nutrition and growing civilization.

¹ Massachusetts, *op. cit.*, pp. 141-6.

² For rates of increase of population in Me., N. H., Vt., since 1890 see United States, *Thirteenth Census, Abstract*, p. 23.

³ Maine, *Registration Report*, no. 20, p. 5.

⁴ These data will be found on pp. 73 and 82 of the 20th, 19th, 18th, and 17th *Registration Reports* and on pp. 75 and 84 of the 16th *Registration Report*.

⁵ Maine, *Registration Report*, no. 4, pp. 79, 88.

Spencer said that the fertility of the race diminished with its intellectual and moral development.¹ But the proof of this thesis has never been satisfactory. Dr. Newsholme says that it is doubtful whether either increased nutrition or increased civilization (in the sense of greater mental and moral development) are important factors in the decline of the birth rate.² Increased nutrition may be responsible in part, but, if so, it is not because of the physiological changes which take place in the human body. It acts, rather, through the will. The problem of the declining birth rate thus becomes a psychological problem involving the study of the attitudes of mind which exist in the different classes of the population.

That competition of peoples having different standards of living is a result of the pressure of population on food is shown clearly in the case of France. It has been shown that the situation of the French people as a whole is good. They have gained their present position through restriction of the population, the utilization of the modern methods of economic production, and their thrift and industry.

Because population is about stationary and because living conditions are relatively good, many of the French economists view the position of France with great apprehension. The reasons for this apprehension are not far to seek. In the first place, they fear that immigration of peoples with lower standards of living from surrounding countries will take place on a large scale, and that these immigrants will multiply so rapidly that they will denationalize the French.³

¹ Spencer, *Principles of Biology* (Revised and Enlarged ed. London, 1899), vol. ii, pt. vi, *passim*, but especially chaps. xii, xiii.

² Newsholme, *op. cit.*, pp. 30-33.

³ In 1910 there were 1,050,000 foreigners who had taken up their residence in France. This is about 2.7% of the total population. See George, *op. cit.*, p. 254, also Leroy-Beaulieu, *La Question de la population* (Paris, 1913), book v, chap. iii.

In the second place, they fear that the nations to the east of them will soon be able to conquer them because their populations are increasing so rapidly.¹ Even in the face of this situation the French economists can see no truth in the theory of Malthus. This is, in part, due to the fact that most of them understand Malthus to mean that population tends to double every twenty-five years, and in part to the fact that they do not see in France the intense struggle for life which Malthus pictured. They fail to recognize that Malthus said the use of the preventive checks was necessary if the condition of a people was to be improved, and that this has taken place in France while the surrounding countries are struggling to keep up a high rate of increase. It is for this reason that the surrounding countries endanger the position of France.

It may well be that the great masses of the people to-day interpret the phrase, *means of subsistence*, in a more liberal way than Malthus and his generation did; but even so, there is no essential difference in the struggle going on to-day in most of the countries of the western world and that going on at the time of Malthus.

CONCLUSIONS

The conclusions to be drawn from this study are four:

1. Malthus was essentially correct in his statement of the law of population as I have given it in Chapter I. When we examine individual countries we find that population increases when food increases (with the exception of France). For the great majority of the people of the western world the pressure upon the *means of subsistence* is the determining factor in the size of the family.

2. Malthus was also correct when he said that much misery and suffering were due to the overcrowding of the

¹ George, *ibid.*, p. 259.

population, and that consequently a large number of people were always in want. It is true that conditions have changed since Malthus, and in the more civilized countries of the western world fewer people die directly because of the lack of food now than formerly. The process of starvation is more refined. It is allowed to drag itself out over a period of years. Besides, our civilization to-day creates new wants and desires, which cannot be satisfied by means of the present income without crowding into close quarters and living on food of bad quality and an insufficient amount of this. There are hundreds of thousands of people in the great cities of America and Europe who satisfy the desires of display at the expense of their physical well-being. These people suffer because it is impossible for them to have enough food and at the same time to have enough of the other things of our modern life which they consider essential to give them the positions they covet in their own little worlds. They and their children suffer much from the lack of food. The death rate in the lower classes shows beyond question that they suffer because they are not able to provide themselves with the essentials of life.

3. Another conclusion which seems to me to be warranted is that population cannot continue to increase at its present rate without being more and more subjected to the actual want of food, provided the distribution of labor between agriculture and the non-agricultural industries continues in its present trend (the trend found in the more highly developed countries). Nor can a greater and greater proportion of the population be devoted to agriculture and the present rate of increase continue without checking a progressive standard of living. The non-agricultural industries are not yielding increasing returns in such ratio that they can furnish the necessary

material means for a progressive standard to such a rapidly increasing population. Thus whatever the direction of development, a progressive standard of life and a population increasing from 1.5 per cent to 2.0 per cent a year cannot go on together for long, in a large part of the world. Therefore, either our present standard of living must be simplified as an increasing proportion of the population becomes rural or the present rate of increase of population must be lowered. Probably both must take place in order to have a really progressive civilization.

To simplify our present standards of living does not necessarily mean a lowering of them. It means rather that a good many of the things of our civilization which we consider essential to-day may be found to be merely passing phases, induced by our rapid industrial development. We have become accustomed to think of civilization and culture and progress as of necessity involving all the complexities of our present existence. It is open to question, however, whether much of our present complexity is not a hindrance to real culture rather than an aid. There cannot be much doubt that as people are becoming more educated they are becoming more self-contained, and they begin to see that the way to get the most out of life is to put the most into it, and not to surround themselves with all the luxuries and baubles they can afford.

But it is doubtful whether even such a simplification of life of the people of the more highly civilized nations will enable them to support in comparative comfort an ever-increasing proportion of their populations, or even the same proportion as at present, if it is not accompanied by a lower rate of natural increase of population. A slower rate of increase of population will give more time to adjust standards of life to surrounding conditions and to direct the course of progress; without it most of our efforts must

be directed towards the more pressing of the problems of our present-day life. A greater and greater control over the growth of population is essential to a growth of rational social control.

4. If population must increase more slowly, from what part of the population should this increase come? The answer to this question involves a study of the eugenic value of the different classes of the population. Supposing the question regarding the eugenic value of classes to be answered satisfactorily, the further question arises: How can an increase in the classes which should increase be brought about, and how can the growth of population be restricted in other classes which should not increase, if the increase in population is not proceeding in a wholly satisfactory way at the present time?

These questions are proposed here not because any answer is to be given, but to show the way in which the population question presents itself to me at the close of this study. "A Study in Malthusianism" is merely a necessary preliminary to a further study along the lines suggested here. If population is increasing more rapidly than it can survive, then the questions about which we are particularly concerned are questions of selection. What is the present process of selection? Is it weeding out the really unfit? Are the better stocks dying out? What determines which stocks shall survive, supposing the action of natural selection shall be mitigated or entirely counteracted, as seems likely to happen?

The answer to these questions involves a further study of population from a different point of view from the one adopted in this study. As the question appears to me, such a study as is made here furnishes a basis for this further study. I hope to make this at some future time.

APPENDIX A

IN this appendix will be found all changes which were made in the original data in compiling the tables on crops, livestock, imports, exports, and population. Most of these changes were necessary because of the lack of data for the exact years given in the tables. A few other changes were made where the data for a given year were not typical. These changes are very few, however, as can be seen from this appendix. The changes made are given separately for each country.

UNITED STATES

Crops. All data from the census are for the year preceding the census, *e. g.* 1859, 1869, *etc.* The data from the reports of the Department of Agriculture are for the census years. All data for wheat are from the census reports. The data for 1910 for all other crops are from the census reports. The data for the other years for maize, oats, barley, and rye are from the reports of the Department of Agriculture and can be found in the Statistical Abstract of the United States (any volume after the given year). The data for pulse and potatoes are from the census reports. The reason that the census reports are not followed in all cases is that the situation of our agriculture appears less favorable if they are followed than if the reports of the Department of Agriculture are followed. I desired to leave no room for the criticism that data were used in this study which would make the situation of our agriculture appear as unfavorable as possible. I have tried rather to make the situation of agriculture appear as favorable as possible.

Livestock. These data are taken from the census reports in all cases. Allowance has been made for the change in the date of taking the census.

Imports and Exports. No changes.

Population. No changes.

UNITED KINGDOM

Crops. No changes.

Livestock. No changes.

Imports and Exports. No changes.

Population. These data are for the years 1861, 1871, *etc.*

CANADA

Crops. No changes.

Livestock. No changes.

Imports and Exports. The data given here for 1870 are for 1872. No data prior to that time.

Population. These data are for the years 1871, 1881, *etc.*

NEW ZEALAND

Crops. The data given here for 1910 are for 1908 no later data being available.

Livestock. No changes.

Imports and Exports. No changes.

Population. These data are for 1881, 1891, *etc.*

INDIA

Crops. The data given here for 1890 are for 1893.

Livestock. The data given here for 1890 are for 1893.

Imports and Exports. No changes.

Population. The data given here are for the years 1891, 1901, *etc.*

AUSTRALIA

Crops. No changes.

Livestock. No changes.

Imports and Exports. No changes.

Population. These data are for the years 1881, 1891, *etc.*

RUSSIA (IN EUROPE)

Crops. The data given here for 1890 include those for Poland for 1892 as no data for Poland are available for 1890.

The acreage data given here for 1890 are for 1887. The data (both acreage and production) given here for 1880 are for 1879 and those given for 1870 are for 1872. Data for Poland are lacking before 1890.

Livestock. The data given here for 1890 are for 1888, and those given for 1880 are for 1882.

Imports and Exports. No changes.

Population. The censuses in Russia have not been regular; the data given here for 1910 are estimated, the data for 1900 are in the census for 1897, those given for 1890 are for 1885, those given for 1880 are for 1867 and those given for 1870 are for 1850.

RUSSIA (IN ASIA)

Crops. The data given here for 1900 are for 1901.

Livestock. No changes.

No other data given.

NORWAY

Crops. Data given here for 1880 and 1870 are for 1875 and 1865 respectively.

Livestock. Data given here for 1880 and 1870 are for 1875 and 1865 respectively.

Population. Data given here for 1880 and 1870 are for 1875 and 1865 respectively.

Imports and Exports. No changes.

SWEDEN

No changes.

DENMARK

Crops. The data on acreage for 1910 are for 1907. No changes in data on production. Data on both acreage and production given here for 1900 are for 1901. The data given here for acreage for 1890 are for 1888, those for production in 1890 are not changed. The data on both acreage and production given here for 1880 are for 1881 and those given for 1870 are for 1876.

Livestock. The data given here for 1910 are for 1909, those given for 1900 are for 1903, those given for 1890 are for 1893, those given for 1880 are for 1881, and those given for 1870 are for 1871.

Imports and Exports. No changes.

Population. This is estimated for 1910.

GERMANY

Crops. No changes.

Livestock. The data given here for 1910 are for 1907, those given for 1890 are for 1892, those given for 1880 are for 1883, those given for 1870 are for 1873, and those given for 1860 are for 1862.

Imports and Exports. The data given here for 1870 are for 1872.

Population. No changes.

NETHERLANDS

Crops. The data given here for 1870 are for 1873.

Livestock. No changes.

Imports and Exports. No changes.

Population. The data given here are for the years 1859, 1869, etc.

BELGIUM

Crops. The data given here for 1870 and 1860 are for 1866 and 1856 respectively.

Livestock. The data given here for 1910 are for 1909, those given for 1900 are for 1901, those given for 1890 are for 1895, those given for 1870 are for 1866, and those given for 1860 are for 1856.

Imports and Exports. No changes.

Population. The data given here for 1880 are for 1879.

FRANCE

Crops. The data given here for 1870 are for 1873.

Livestock. The data given here for 1910 are for 1909, and those given for 1870 are for 1875.

Imports and Exports. No changes.

Population. The data given here are for 1871, 1881, etc.

ITALY

Crops. The data given here for 1900 are for 1895, those given for 1880 are an average of the years 1876 and 1881, and those given for 1870 are for 1874.

Livestock. The data given here for 1910 are for 1908. There are no data available between 1882 and 1908 so those given here for 1900 and 1890 are estimates based on the assumption that the rate of increase is constant. The data given here for 1880 are for 1881, and those given for 1870 are for 1874.

Imports and Exports. No changes.

Population. These data are for the years 1871, 1881, etc.

AUSTRIA

Crops. The data given here for 1870 are for 1874.

Livestock. The data given here for 1870 are for 1869.

Imports and Exports. No changes.

Population. The data given here for 1870 are for 1869.

HUNGARY

Crops. The data given here for 1870 are for 1875.

Livestock. The data given here for 1910 are for 1909, those given for 1900 are for 1895, and those given for 1890 are estimated on the basis of the total increase between 1880 and 1895.

Imports and Exports. No changes. (See Austria.)

Population. The data given here for 1870 are for 1869.

ROUMANIA

Crops. No changes.

Livestock. The data given here for 1880 are for 1884.

Imports and Exports. The data given here for 1910 are for 1909, and those given for 1880 are for 1883.

Population. The data given here for 1910, 1900, 1890 are official estimates as no censuses were taken for those years.

BULGARIA

Crops. The data given here for 1900 are for 1906. These are the earliest data available.

Livestock. The data given here for 1910 are for 1905, and those given for 1890 are for 1892.

Imports and Exports. No changes.

Population. The data given here for 1890 are an average of the data for 1893 and 1888 as there was no census in 1890. The data given here for 1880 are for 1881.

ALGERIA

Crops. The data given here for 1900 are for 1906.

Livestock. The data given here for 1900 are for 1901 and those given for 1890 are for 1897.

Imports and Exports. Not included in this study.

Population. Not included in this study.

URUGUAY

Crops. The data given here for 1900 are for 1905.

Livestock. The data given here for 1910 are for 1908 and those given for 1890 are for 1897.

Imports and Exports. The data given here for 1910 are for 1909.

Population. The data given here for 1910 are for 1908, those given for 1890 are for 1891, and are an official estimate. Those given for 1880 are for 1879 and those given for 1870 are an estimate based on the rate of increase between 1860 and 1879.

ARGENTINA

Crops. The data given here for 1900 are for 1907. There are no earlier data.

Livestock. The data given here for 1900 are for 1895 and those given for 1890 are for 1888.

Imports and Exports. No changes.

Population. The data given here for 1910 are taken from Leroy-Beaulieu, *La Question de la population*, p. 135. The data given for 1890 are for 1895 and those given for 1870 are for 1869.

CHILE

Crops. The data given here for 1900 are for 1907.

Livestock. The data given here for 1900 are for 1906.

Imports and Exports. The data given here for 1910 are for 1909.

Population. The data given here for 1910, 1900, and 1870 are official estimates. Those given for 1880 and 1890 are for 1875 and 1885 respectively.

SPAIN

Crops. The data given here for 1900 are for 1907.

Livestock. The data given here for 1900 are for 1906, those given for 1890 are for 1891, those given for 1880 are estimated, and those given for 1870 are for 1865.

Imports and Exports. No changes.

Population. The data given here for 1890 are for 1887, those given for 1880 are for 1877, and those given for 1870 are for 1871.

JAPAN

Crops. No changes.

Livestock. The data given here for 1890 are for 1891.

Imports and Exports. The data given here for 1910 are for 1909 and those for 1880 are for 1882.

Population. The data given here for 1890 are for 1891 and those given for 1870 are for 1872. The data for 1880 are estimated by the author from the rate of increase. No census of Japan has ever been taken. These data are all official estimates except as mentioned above.

APPENDIX B

The percentages of increase of population, the rates of natural increase, the percentages of increase or decrease in the production of cereals and cattle, the percentages of increase or decrease in the value of imports and exports of foodstuffs, and the number of emigrants or immigrants for the United States and the principal countries of Europe are brought together in this table. The reason for doing this is to make the verification of some of the statements in the text easier for the reader.

UNITED STATES

	1910	1900	1890	1880	1870	1860
% of increase in population ..	21.0	20.7	25.5	30.1	22.6	35.6
Rate of natural increase	13.3	16.8	18.5	24.2	16.7	
% of increase in cereals	21.4	5.9	29.2	64.7		
% of increase in cattle	3.0	2.0	43.0	50.8	—10.9	44.1
% of increase in value of exports	—32.3	52.8	—22.3	395.2	82.6	
% of increase in value of imports	41.3	—11.7	19.8	45.3	67.8	
Immigrants (net) (thousands)..	5,863	2,459	3,498	2,250	1,854	2,079

UNITED KINGDOM

% of increase in population ..	9.07	9.87	8.16	10.80	8.84	
Rate of natural increase	10.5	10.7	10.9	12.9	12.2	
% of increase in cereals	1.5	—8.7	decreasing			
% of increase in cattle	2.7	6.1	9.3	6.8		
% of increase in value of exports	41.0	13.2	—1.9	23.5	65.0	
% of increase in value of imports	17.1	24.9	—4.0	65.4	30.0	
Emigrants (net) (thousands)..	1,481	725	1,729	832		

FRANCE

	1910	1900	1890	1880	1870	1860
% of increase in population ..	1.6	1.6	1.8	4.3	—3.4	
Rate of natural increase	0.4	1.1	0.4	2.5	1.7	
% of increase in cereals	5.7	—5.7	7.1	19.3		
% of increase in cattle	—1.5	7.0	18.4	0.7	—11.3	
% of increase in value of exports	11.6	—10.1	28.2	8.8		
% of increase in value of imports	72.5	—43.3	—15.7	147.8		

GERMANY

% of increase in population ..	15.8	13.8	9.2	12.5	6.6	
Rate of natural increase	13.3	14.9	12.4	12.1	13.1	
% of increase in cereals	11.4	40.0	15.6			
% of increase in cattle	8.9	7.8	11.2	00.0	5.1	
% of increase in value of exports	44.6	9.9	—16.3	44.7		
% of increase in value of imports	39.9	26.2	11.2	24.7		
Emigrants (landed in U. S.) (thousands)	342	508	1,391	709	787	

RUSSIA IN EUROPE

% of increase in population ..	23.4	15.5	29.3	8.0		
Rate of natural increase	17.0	17.0	12.8			
% of increase in cereals	31.3	17.2	26.5	—0.1		
% of increase in cattle	—6.4	30.0	15.8	11.3		
% of increase in value of exports	130.5	1.7	54.7	42.7		
% of increase in value of imports	64.9	38.7	—37.2	154.0		
Emigrants (landed in the U. S.) (thousands)	1,597	612	265	49		

AUSTRIA

% of increase in population ..	9.2	9.4	7.9	9.5		
Rate of natural increase	10.8	11.9	8.8	7.9	8.3	
% of increase in cereals	35.9	—6.6	14.7	—3.3		
% of increase in cattle	—3.6	10.0	0.7	15.6		
% of increase in value of exports	—26.1	—10.5	22.7			
% of increase in value of imports	—13.1	45.9	—29.5			

HUNGARY ¹

	1910	1900	1890	1880	1870	1860
% of increase in population ..	8.3	10.2	10.9	1.5		
Rate of natural increase	11.2	11.7	9.3	11.0	6.2	
% of increase in cereals	11.6	16.0	25.6			
% of increase in cattle	6.1	10.4	14.8	0.6		
Emigrants (for Austria also)						
(thousands)	2,017	671	444	74		

ITALY

% of increase in population ² ..	6.8	6.3	7.3	6.2	23.0	
Rate of natural increase	11.2	10.7	10.7	7.7	7.2	
% of increase in cereals	12.9	-2.6 ³	-4.6	-7.7		
% of increase in cattle	12.7	10.0	4.7	36.7		
% of increase in value of exports	75.5	36.9	-22.5	33.5		
% of increase in value of imports	127.2	-8.9	54.8	-5.6		
Emigrants (number returning not given) (thousands)	5,531	1,487	990	119		

CONSTRUCTION OF GRAPHS ON PAGES III AND II2

I shall illustrate the method of construction of the graphs on p. III by showing how the curve for the growth of population of the United States was plotted. If we take the data on population and find the logarithms of the numbers, we get the following results: 1860, 7.49748; 1870, 7.58602; 1880, 7.70027; 1890, 7.79893; 1900, 7.88076; 1910, 7.96365.

The base line on this graph represents the log. for 1860, viz., 7.49748. The distance from the base line to the line representing the growth of population is determined by the difference between the logarithms of the population in 1860 and in each of the following decades. *E. g.*, the difference between the logs. for 1860 and 1870 is .089 (there is no need to secure

¹ The imports and exports of Austria and Hungary are not given separately.

² These percentages and rates represent the increase from one decade to the next, *e. g.*, the percentages for 1910 represent the increase between 1900 and 1910.

³ The minus (—) sign denotes a decrease.

the difference to more than three places, because a more minute difference could not be plotted on such graphs as must be used here.) The difference between the logs. for 1860 and 1880, 1860 and 1890, *et cetera*, are respectively, .203, .301, .383, .466. The scale on which these differences are plotted is as follows: the difference between the logs. for 1860 and 1910 is .466. On the graph the first figure to the right of the decimal is expressed in centimeters, the second in millimeters, and the third in fractions of a millimeter, .6 of a millimeter in this case. Thus the distance of the line representing the growth of population in 1910 from the base in 1860 should be 4 centimeters, 6.6 millimeters. The differences between the logs. for the other items in these graphs are plotted in the same way. In every case the log. for the earliest data obtainable is made the base and the curve represents the difference between this log. and those of the succeeding decades. Of course, the base for each item plotted in these graphs is different, but inasmuch as the purpose is to compare the percentage increases and decreases of these various items for the period of time covered by this study, the use of the same base line is not necessary. The same results would have been secured by plotting the percentages of increase or decrease of these same items. These percentages are given above in this appendix.

There is one point yet which should be emphasized. The increases or decreases represented in these curves are always on the basis of the log. For the earliest data obtainable, and in no case are absolute numbers plotted. Thus, when one sees that the curve representing exports of the United Kingdom rises more rapidly than the curve representing imports between 1900 and 1910, he is not to conclude that the actual quantity of foodstuffs imported was less than that exported, but merely that on the base of 1860 the relative increase of exports was greater than the relative increase of imports. In the case of imports and exports it will be well to refer to the absolute amounts of these, the data for which are given in Appendix C. It is not so important to do this for the other items plotted in these graphs. (See note on p. 112.)

LOGARITHMS FROM WHICH THE GRAPHS ON PAGES III AND II2 ARE CON-
STRUCTED

United States—

	1910	1900	1890	1880	1870	1860
Population	7.96365	7.88076	7.79893	7.70027	7.58602	7.49748
Cattle	7.73231	7.71933	7.71063	7.55534	7.37694	7.40858
Cereals	9.35430	9.26998	9.24502	9.13354	8.91698	
Imports (value) ..	8.51362	8.36342	8.41797	8.33925	8.17667	7.95187
Exports (value) ..	8.56703	8.73672	8.55242	8.66219	7.96741	7.70578

United Kingdom—

Population	7.65533	7.61752	7.57669	7.54258	7.49803	7.46120
Cattle	7.07041	7.05881	7.03302	6.99436	6.96544	
Cereals	8.09377	8.08600	8.15655			
Imports (value) ..	8.41095	8.34223	8.24576	8.26364	8.04493	7.93120
Exports (value) ..	7.59040	7.41814	7.36436	7.37273	7.28103	7.06333

Germany—

Population	7.81238	7.74850	7.69232	7.65408	7.60293	7.57530
Cattle	7.31450	7.27738	7.24428	7.19811	7.19783	7.17609
Cereals	8.70157	8.65475	8.50853	8.44498		
Imports (value) ..	9.39217	9.24625	9.14520	9.09968	9.00389	
Exports (value) ..	8.87448	8.71433	8.67302	8.75051	8.58995	

France—

Population	7.59770	7.59062	7.58365	7.57600	7.55751	7.57264
Cattle	7.15503	7.16197	7.13226	7.05843	7.05500	7.10755
Cereals	8.56015	8.53832	8.56384	8.53403	8.45743	
Imports (value) ..	9.15014	8.91339	9.15987	9.23401	8.83998	
Exports (value) ..	8.93359	8.88604	8.93217	8.82406	8.78746	

Italy—

Population	7.53995	7.51121	7.48473	7.45423	7.42830	7.33786
Cattle	6.79232	6.74036	6.69897	6.67870	6.54270	
Cereals	8.16997	8.11727	8.12840	8.17898	8.18441	
Imports (value) ..	8.81941	8.46300	8.50365	8.31366	8.33866	
Exports (value) ..	8.78760	8.54332	8.40688	8.51746	8.39199	

Russia—

Population	8.11727	8.02572	7.96313	7.85138	7.81776	
Cattle	7.52608	7.55522	7.44122	7.37731	7.33041	
Cereals	9.11594	8.99167	8.92505	8.82295	8.81591	
Imports (value) ..	8.28058	8.06333	7.92143	8.12352	7.71858	
Exports (value) ..	8.97708	8.64437	8.60713	8.41764	8.26316	

APPENDIX C

TABLE I.—ACREAGE AND PRODUCTION ¹ OF WHEAT, 1860-1910

(Expressed in thousands)

Country	1910	1900	1890	1880	1870	1860
United States—						
Acres	44,263	52,589	33,580	35,430	18,993	12,000
% increase ..	-15.8 ²	56.6	-5.2	86.5	49.4	
Production ..	410,024	395,120	281,024	275,690	172,648	103,863
% increase ..	3.8	40.6	1.9	59.6	66.2	
United Kingdom—						
Acres	1,858	1,901	2,484	3,066	3,774	
% increase ..	-2.2	-23.4	-18.9	-23.0		
Production ..	34,974	33,571	46,964			
% increase ..	4.1	-28.5				
Canada—						
Acres	9,258	4,224	2,724	2,342		
% increase ..	119.1	55.0	16.3			
Production ..	83,610	33,333	25,232	19,410		
% increase ..	150.8	32.1	29.9			
New Zealand—						
Acres	252	208	301	325	78	
% increase ..	21.1	-30.8	-7.3	316.6		
Production ..	5,422	4,034	3,537	5,035		
% increase ..	34.4	14.0	29.7	808.8		
India—						
Acres	30,565	23,865	28,717			
% increase ..	28.0	-16.8				
Production ..	263,207	163,662	167,710			
% increase ..	60.8	-2.4				

¹ The British statute acre is used throughout and the quantity is given in cwt. This applies to Tables I-VII in this appendix.

² The minus (—) sign indicates a decrease in all tables.

TABLE I.—*Continued*

Country	1910	1900	1890	1880	1870	1860
Australia—						
Acres	7,372	5,667	3,236			
% increase ..	30.0	75.1				
Production ..	58,779	29,882	16,759			
% increase ..	96.7	78.3				
Russia in Europe—						
Acres	62,604	41,289	30,104	28,604	28,743	
% increase ..	51.6	37.1	5.2	—0.5		
Production ..	373,515	180,994	142,143	102,660	97,606	
% increase ..	106.3	27.3	38.4	5.1		
Russia in Asia—						
Acres	17,894	6,416				
% increase ..	178.8					
Production ..	107,274	35,905				
% increase ..	198.7					
Norway—						
Acres	12	13	11	11	12	12
% increase ..	—7.6	18.0		—8.5		
Production ..	178	201	158	170	162	
% increase ..	—11.4	27.2	—7.0	4.9	—3.6	
Sweden—						
Acres	241	192	174	150		
% increase ..	25.5	11.0	16.0			
Production ..	4,520	3,143	2,369	1,880		
% increase ..	43.8	32.6	26.0			
Denmark—						
Acres	100	32	120	127	140	
% increase ..	212.5	—73.3	—5.5	—9.3		
Production ..	2,708	560	2,416	1,845	2,756	
% increase ..	383.5	—76.8	30.9	—33.0		
Germany—						
Acres	4,842	5,061	4,842	4,484		
% increase ..	—4.3	4.5	7.9			
Production ..	75,988	75,589	55,708	46,152		
% increase ..	0.5	35.6	20.7			
Netherlands—						
Acres	135	158	210	229	232	
% increase ..	—14.5	—24.7	—8.3	—1.2		
Production ..	2,663	2,797	3,249	3,535	4,062	
% increase ..	—4.7	—13.9	—8.0	—12.9		

TABLE I.—*Continued*

Country	1910	1900	1890	1880	1870	1860
Belgium—						
Acres	380	417	800	682	700	
% increase ..	—8.8	—47.8	17.3	—2.5	6.0	
Production ..	6,667	7,384	13,324	10,908	8,777	
% increase ..	—9.7	—44.5	22.1	24.2	10.1	
France—						
Acres	16,189	16,954	17,442	16,978	17,207	
% increase ..	—4.5	—2.8	2.7	—1.3		
Production ..	204,100	194,951	198,699	170,891	142,522	
% increase ..	4.7	—1.8	16.2	19.9		
Italy—						
Acres	11,754	11,345	10,886	11,700	11,551	
% increase ..	3.6	4.2	—6.9	1.2		
Production ..	82,158	79,626	78,720	86,502	88,017	
% increase ..	3.1	1.1	—8.9	—1.7		
Austria—						
Acres	2,998	2,631	2,834	2,455	2,382	
% increase ..	13.9	—7.1	15.4	3.0		
Production ..	34,914	25,053	26,389	24,306	24,733	
% increase ..	39.3	—5.0	8.5	—1.7		
Hungary—						
Acres	9,371	8,803	7,357	5,956	5,654	
% increase ..	6.0	19.6	23.5	5.3		
Production ..	97,010	91,489	88,654	47,509	29,288	
% increase ..	6.0	3.2	86.6	62.2		
Roumania—						
Acres	4,812	3,926	3,729			
% increase ..	22.5	5.2				
Production ..	66,427	33,935	32,128			
% increase ..	95.7	5.6				
Bulgaria—						
Acres	2,689	2,100				
% increase ..	28.0					
Production ..	22,626	17,000				
% increase ..	33.0					
Algeria—						
Acres	3,553	3,000				
% increase ..	18.4					
Production ..	10,213	17,000				
% increase ..	13.0					

TABLE I.—*Concluded*

Country	1910	1900	1890	1880	1870	1860
Uruguay—						
Acres	636					
% increase ..						
Production ..	3,199					
% increase ..						
Argentina—						
Acres	14,416	13,400				
% increase ..	7.5					
Production ..	95,271	92,800				
% increase ..	2.6					
Chile—						
Acres	1,095	1,000				
% increase ..	9.5					
Production ..	13,746	9,000				
% increase ..	52.7					
Spain—						
Acres	9,409	8,400				
% increase ..	12.0					
Production ..	73,613	67,200				
% increase ..	9.5					
Japan—						
Acres	1,165	1,148				
% increase ..	1.4					
Production ..	14,125	12,987				
% increase ..	8.7					
Total—						
Acres	257,863	214,739	149,551	112,539	89,466	12,672
% increase ..	20.0	43.5	32.8	25.7		
Production ..	2,155,931	1,607,216	1,185,183	796,493	571,125	113,797
% increase ..	34.1	35.6	48.4	39.4		

TABLE II.—ACREAGE AND PRODUCTION OF MAIZE AND MIXED CORN,
1860-1910

(Expressed in thousands)

Country	1910	1900	1890	1880	1870	1860
United States—						
Acres	98,383	82,109	78,320	60,743	32,716	
% increase ..	19.8	4.8	28.9	85.6		
Production ..	1,429,226	1,163,761	1,183,219	860,980	543,170	
% increase ..	22.8	—1.6	37.4	58.5		

TABLE II.—*Continued*

Country	1910	1900	1890	1880	1870	1860
United Kingdom. No data.						
Canada—						
Acres	353	361	229			
% increase ..	—2.2	57.6				
Production ..	14,433	14,490	5,978			
% increase ..	—0.4	142.3				
New Zealand. No data.						
India. No data.						
Australia—						
Acres	415	344	301			
% increase ..	20.6	14.2				
Production ..	7,304	5,239	4,851			
% increase ..	39.4	7.9				
Russia in Europe—						
Acres	3,631	3,410	1,488	1,361		
% increase ..	6.4	129.1	9.3			
Production ..	38,471	34,000	13,557	10,794		
% increase ..	13.1	150.7	26.1			
Russia in Asia—						
Acres	792	456				
% increase ..	73.6					
Production ..	7,237	3,799				
% increase ..	90.4					
Norway—						
Acres	15	19	35	51	48	
% increase ..	—20.8	—45.7	—31.3	6.2		
Production ..	351	420	807	1,109	1,071	
% increase ..	—16.4	—47.9	—27.2	3.5		
Sweden—						
Acres	400	320	260	160	140	
% increase ..	25.0	23.0	62.5	14.6		
Production ..	8,625	6,343	5,139	3,112	2,740	
% increase ..	35.9	23.4	65.1	13.5		
Denmark—						
Acres	418	352	333	208	165	
% increase ..	18.7	5.7	60.0	26.0		
Production ..	9,540	7,286	6,763	2,096	2,387	
% increase ..	30.9	7.7	222.6	—12.1		

TABLE II.—*Continued*

Country	1910	1900	1890	1880	1870	1860
Germany. No data.						
Netherlands. No data.						
Belgium. No data.						
France—						
Acres	1,527	1,832	2,083	2,654	2,863	
% increase ..	—16.6	—12.0	—21.5	—7.8		
Production ..	16,017	17,543	20,898	25,973	24,148	
% increase ..	—8.7	—16.0	—19.5	7.5		
Italy—						
Acres	4,003	4,834	4,722	4,235	4,190	
% increase ..	—17.2	2.3	11.4	1.0		
Production ..	50,829	39,445	41,955	49,716	49,388	
% increase ..	28.8	—5.9	—15.6	—0.7		
Austria—						
Acres	976	884	972	882	797	
% increase ..	10.4	—9.0	10.2	10.6		
Production ..	11,564	9,382	11,659	10,267	9,708	
% increase ..	23.2	—19.5	13.5	5.7		
Hungary—						
Acres	7,212	6,742	5,151	5,114	4,856	
% increase ..	6.9	30.8	0.7	5.3		
Production ..	108,560	83,678	54,370	58,973	48,125	
% increase ..	29.7	53.9	—7.8	22.5		
Roumania—						
Acres	4,906	5,027	4,400			
% increase ..	—2.4	14.2				
Production ..	58,017	47,597	34,717			
% increase ..	21.8	37.0				
Bulgaria—						
Acres	1,746	1,451				
% increase ..	20.3					
Production ..	16,154	15,935				
% increase ..	13.7					
Algeria—						
Acres	35	38				
% increase ..	—7.8					
Production ..	277					
% increase ..	1.9					

TABLE II.—*Concluded*

Country	1910	1900	1890	1880	1870	1860
Uruguay—						
Acres	635	410				
% increase ..	54.8					
Production ..	1,904	1,613				
% increase ..	18.0					
Argentina—						
Acres	7,422	6,717				
% increase ..	10.4					
Production ..	87,570	68,009				
% increase ..	28.7					
Chile—						
Acres	67	63				
% increase ..	6.0					
Production ..	895	672				
% increase ..	33.1					
Spain—						
Acres	1,121	1,109				
% increase ..	1.0					
Production ..	13,679	12,682				
% increase ..	7.8					
Japan—						
Acres	131					
% increase ..						
Production ..	2,074					
% increase ..						
Total—						
Acres	134,188	116,478	94,694	75,408	45,775	
% increase ..	15.2	23.0	25.5	64.7		
Production ..	1,882,727	1,532,167	1,383,913	1,023,020	680,737	
% increase ..	22.8	10.7	35.2	50.2		

TABLE III.—ACREAGE AND PRODUCTION OF OATS, 1870-1910
(Expressed in thousands)

Country	1910	1900	1890	1880	1870
United States—					
Acres	35,159	26,341	27,462	16,797	9,746
% increase ..	33.4	—4.0	63.4	72.3	
Production ..	322,281	254,777	240,485	199,723	87,357
% increase ..	26.5	5.9	20.4	128.6	

TABLE III.—*Continued*

Country	1910	1900	1890	1880	1870
United Kingdom—					
Acres	4,116	4,146	4,138	4,192	4,425
% increase ..	—0.7	0.2	1.2	—5.2	
Production ..	58,012	54,495	56,527	57,000	58,000
% increase ..	6.4	—3.5	—0.8	—1.6	
Canada—					
Acres	9,035	5,367	4,128	3,500	
% increase ..	68.3	30.0	17.9		
Production ..	95,281	49,997	27,230	23,263	
% increase ..	90.5	83.6	17.0		
New Zealand—					
Acres	407	450	346	215	122
% increase ..	—9.5	—30.0	60.0	76.2	
Production ..	6,239	6,298	3,282	2,274	1,255
% increase ..	—0.9	91.8	44.3	81.1	
India. No data.					
Australia—					
Acres	677	470	271		
% increase ..	44.0	73.0			
Production ..	5,091	3,974	1,933		
% increase ..	28.1	105.5			
Russia in Europe—					
Acres	42,906	40,003	37,255	34,190	32,891
% increase ..	7.2	7.3	8.9	4.2	
Production ..	275,209	226,511	186,746	171,761	179,396
% increase ..	21.4	21.2	8.7	—4.2	
Russia in Asia—					
Acres	5,725	689			
% increase ..	739.0				
Production ..	31,542	3,398			
% increase ..	828.2				
Norway—					
Acres	263	241	242	224	220
% increase ..	9.0	—0.4	8.0	1.8	
Production ..	3,352	3,153	3,139	2,936	2,634
% increase ..	5.4	0.4	6.9	11.4	

TABLE III.—*Continued*

Country	1910	1900	1890	1880	1870
Sweden—					
Acres	1,956	2,037	1,978	1,700	1,600
% increase ..	—3.9	2.9	16.3	6.2	
Production ..	22,757	22,153	23,377	15,452	12,719
% increase ..	2.7	—5.2	51.2	21.4	
Denmark—					
Acres	993	1,067	1,050	911	864
% increase ..	—6.9	1.5	17.1	5.4	
Production ..	12,894	11,882	11,769	9,256	9,554
% increase ..	8.5	0.9	27.1	—3.1	
Germany—					
Acres	10,594	10,183	9,643	9,246	
% increase ..	4.0	5.5	4.2		
Production ..	155,468	139,559	96,692	83,204	
% increase ..	11.4	44.3	16.2		
Netherlands—					
Acres	348	325	284	291	253
% increase ..	7.0	14.4	—2.3	15.0	
Production ..	5,768	5,531	4,234	4,327	3,715
% increase ..	4.3	30.6	—2.1	16.4	
Belgium—					
Acres	617	626	736	616	567
% increase ..	—1.5	—14.9	19.4	8.6	
Production ..	11,561	11,190	29,879	26,572	23,364
% increase ..	3.3	—62.5	12.4	13.7	
France—					
Acres	9,760	9,735	9,338	8,577	7,861
% increase ..	0.2	4.2	8.8	9.1	
Production ..	92,991	80,141	84,974	77,100	61,612
% increase ..	16.0	—5.6	10.2	25.1	
Italy—					
Acres	1,243	1,171	1,119	939	985
% increase ..	6.1	4.6	19.1	—4.6	
Production ..	8,162	6,138	6,080	6,090	6,392
% increase ..	32.9	0.9	—0.2	—4.7	
Austria—					
Acres	4,528	4,691	4,628	4,435	4,349
% increase ..	—3.5	1.3	4.3	1.9	
Production ..	40,471	33,597	33,333	29,657	25,463
% increase ..	20.4	0.8	12.3	16.4	

TABLE III.—*Continued*

Country	1910	1900	1890	1880	1870
Hungary—					
Acres	2,880	2,672	2,453	2,514	2,429
% increase ..	7.7	8.9	—2.4	3.5	
Production ..	21,342	22,604	17,040	19,719	7,100
% increase ..	—5.5	32.6	—13.5	177.7	
Roumania—					
Acres	1,103	631	441		
% increase ..	74.8	43.0			
Production ..	9,480	2,783	2,425		
% increase ..	240.6	14.7			
Bulgaria—					
Acres	489	469			
% increase ..	4.2				
Production ..	3,083	3,394			
% increase ..	—9.1				
Algeria—					
Acres	434	316			
% increase ..	37.3				
Production ..	3,291	2,679			
% increase ..	22.8				
Uruguay—					
Acres	29	2			
% increase ..					
Production ..	169	11			
% increase ..					
Argentina—					
Acres	1,414	954			
% increase ..	38.2				
Production ..	11,630	9,697			
% increase ..	19.9				
Chile—					
Acres	61	90			
% increase ..	33.2				
Production ..	970	519			
% increase ..	86.8				
Spain—					
Acres	1,255	1,186			
% increase ..	5.8				
Production ..	8,289				
% increase ..	70.7				

TABLE III.—*Concluded*

Country	1910	1900	1890	1880	1870
Japan—					
Acres	97				
% increase ..					
Production ..	1,217				
% increase ..					
Total—					
Acres	136,089	113,862	105,512	88,347	66,240
% increase ..	19.5	7.9	19.4	33.3	
Production ..	1,206,549	959,336	829,145	728,344	478,561
% increase ..	25.7	15.7	13.8	52.1	

TABLE IV.—ACREAGE AND PRODUCTION OF BARLEY, 1870-1910

(Expressed in thousands)

Country	1910	1900	1890	1880	1870
United States—					
Acres	7,698	2,878	3,221	1,681	1,109
% increase ..	167.4	—1.1	91.6	51.5	
Production ..	83,194	35,223	37,600	10,336	12,621
% increase ..	136.3	—6.3	94.4	53.2	
United Kingdom—					
Acres	1,889	2,172	2,301	2,695	2,624
% increase ..	—12.5	—5.6	14.6	2.7	
Production ..	31,207	33,930	39,971	42,000	40,000
% increase ..	—8.0	—15.1			
Canada—					
Acres	1,704	872	881	848	
% increase ..	95.4	—1.0	3.8		
Production ..	21,317	11,000	8,290	8,338	
% increase ..	93.8	32.6	—0.6		
New Zealand—					
Acres	49	35	32	47	23
% increase ..	40.0	9.3	—31.9	104.0	
Production ..	959	509	375	604	286
% increase ..	88.4	35.7	—37.9	111.1	
India—					
Acres	7,840	7,593			
% increase ..	3.2				
Production ..	78,400	75,930			
% increase ..	3.2				

TABLE I V—*Continued*

Country	1910	1900	1890	1880	1870
Australia—					
Acres	108	98	117		
% increase ..	10.2	—16.2			
Production ..	1,102	898	1,003		
% increase ..	22.7	—10.4			
Russia in Europe—					
Acres	27,747	18,700	16,443	15,317	15,521
% increase ..	48.3	13.7	7.3	—1.2	
Production ..	193,753	87,858	87,367	59,688	61,753
% increase ..	120.5	0.6	46.3	—3.3	
Russia in Asia—					
Acres	4,273	1,706			
% increase ..	150.4				
Production ..	29,320	10,974			
% increase ..	167.1				
Norway—					
Acres	81	98	128	138	122
% increase ..	—17.3	—23.4	—7.2	13.1	
Production ..	1,390	1,681	2,026	2,121	1,856
% increase ..	—17.3	—17.0	—4.4	14.2	
Sweden—					
Acres	451	537	546	506	
% increase ..	—16.0	—1.6	7.9		
Production ..	6,427	7,093	7,721	7,066	
% increase ..	—9.3	—8.1	9.2		
Denmark—					
Acres	566	694	735	718	700
% increase ..	—18.4	—5.6	2.3	2.5	
Production ..	10,383	10,617	11,375	10,133	10,930
% increase ..	—2.2	—6.6	12.2	—7.8	
Germany—					
Acres	3,879	4,125	4,111	4,011	
% increase ..	—5.9	0.3	2.4		
Production ..	57,126	59,079	44,935	42,223	
% increase ..	—3.3	31.4	6.4		
Netherlands—					
Acres	69	94	104	117	110
% increase ..	—26.6	—9.6	—11.1	6.3	
Production ..	1,489	2,198	1,993	2,385	2,261
% increase ..	—32.2	10.2	—16.4	5.4	

TABLE IV.—*Continued*

Country	1910	1900	1890	1880	1870
Belgium—					
Acres	79	95	97	99	107
% increase ..	—16.8	—1.9	—1.9	—7.5	
Production ..	1,606	2,039	2,117	1,709	1,815..
% increase ..	21.2	—3.7	23.8	—5.8	
France—					
Acres	1,849	1,870	2,167	2,559	2,762
% increase ..	—1.1	—13.7	—15.3	—7.3	
Production ..	20,857	19,594	23,355	26,163	25,500
% increase ..	6.4	—16.1	—10.7	2.6	
Italy—					
Acres	611	733	820	1,180	1,148
% increase ..	—16.6	—10.6	—36.5	2.8	
Production ..	4,063	3,568	5,258	8,766	9,117
% increase ..	13.8	—32.1	—40.4	—3.8	
Austria—					
Acres	2,721	3,048	2,576	2,665	2,732
% increase ..	—10.7	18.3	—3.3	—2.4	
Production ..	31,149	33,584	26,119	24,243	23,755
% increase ..	—7.2	28.5	7.7	2.0	
Hungary—					
Acres	2,873	2,667	2,488	2,417	2,242
% increase ..	7.7	7.1	2.9	7.8	
Production ..	23,879	26,007	25,383	24,425	22,913
% increase ..	—8.1	2.4	3.9	6.5	
Roumania—					
Acres	1,357	1,084	1,280		
% increase ..	25.1	—15.3			
Production ..	14,082	7,012	7,940		
% increase ..	100.8	—11.6			
Bulgaria—					
Acres	643	574			
% increase ..	12.0				
Production ..	6,034	5,145			
% increase ..	17.2				
Algeria—					
Acres	3,319	3,236			
% increase ..	2.5				
Production ..	20,390	20,394			
% increase ..					

TABLE IV.—*Concluded*

Country	1910	1900	1890	1880	1870
Uruguay—					
Acres	2	3			
% increase ..					
Production ..	11	15			
% increase ..					
Argentina—					
Acres	148	231			
% increase ..	—35.9				
Production ..	1,628	2,541			
% increase ..	—35.9				
Chile—					
Acres	109	137			
% increase ..	—20.4				
Production ..	2,037	1,607			
% increase ..	26.7				
Spain—					
Acres	3,332	3,560			
% increase ..	—6.4				
Production ..	32,695	22,964			
% increase ..	42.3				
Japan—					
Acres	3,176	1,579			
% increase ..	101.1				
Production ..	36,307	21,261			
% increase ..	70.7				
Total—					
Acres	76,583	58,419	38,047	34,998	29,191
% increase ..	31.1	53.5	8.7	19.8	
Production ..	710,805	502,721	332,828	279,200	212,807
% increase ..	41.3	51.0	19.1	31.2	

TABLE V.—ACREAGE AND PRODUCTION OF RYE AND SPELT, 1870-1910

(Expressed in thousands)

Country	1910	1900	1890	1880	1870
United States—					
Acres	2,196	1,659	2,171	1,870	1,346
% increase ..	32.3	—23.5	16.1	38.9	
Production ..	16,531	13,419	15,915	13,703	10,229
% increase ..	23.2	—15.6	16.1	33.9	

TABLE V.—*Continued*

Country	1910	1900	1890	1880	1870
United Kingdom. No data.					
Canada. No data.					
New Zealand. No data.					
India. No data.					
Australia. No data.					
Russia in Europe—					
Acres	69,677	71,730	68,949	64,170	66,399
% increase ..	—2.8	4.0	7.4	—3.3	
Production ..	425,155	451,719	411,698	320,317	315,795
% increase ..	—5.8	9.7	28.5	1.4	
Russia in Asia—					
Acres	2,837	700			
% increase ..	305.0				
Production ..	16,880	4,036			
% increase ..	318.2				
Norway—					
Acres	37	32	34	37	32
% increase ..	15.6	—6.0	—8.4	15.6	
Production ..	504	501	530	587	490
% increase ..	0.6	—5.8	—9.7	19.8	
Sweden—					
Acres	992	1,015	964	937	888
% increase ..	—2.2	5.3	2.9	5.5	
Production ..	12,820	14,556	12,462	10,558	9,497
% increase ..	—11.9	16.8	18.0	11.1	
Denmark—					
Acres	711	672	693	607	576
% increase ..	5.8	—3.0	14.1	5.5	
Production ..	10,870	9,230	9,359	9,118	9,238
% increase ..	16.1	—1.3	2.6	—1.3	
Germany—					
Acres	16,008	15,493	15,282	15,578	
% increase ..	3.3	1.4	—1.9		
Production ..	214,479	177,442	125,176	107,089	
% increase ..	20.8	41.7	16.8		
Netherlands—					
Acres	549	530	504	488	495
% increase ..	3.5	5.1	3.2	—1.4	
Production ..	8,612	7,645	6,234	5,248	5,996
% increase ..	12.6	22.6	18.7	—12.4	

TABLE V.—*Continued*

Country	1910	1900	1890	1880	1870
Belgium—					
Acres	671	665	896	816	873
% increase ..	0.9	—25.7	9.8	—6.5	
Production ..	11,715	10,749	14,457	13,085	13,211
% increase ..	8.9	—25.6	10.4	—0.9	
France—					
Acres	2,993	3,507	3,924	4,542	4,724
% increase ..	—14.6	—10.6	—13.6	—3.8	
Production ..	29,281	33,174	38,385	41,941	33,001
% increase ..	—11.7	—13.5	—8.4	27.0	
Italy—					
Acres	301	338	349		
% increase ..	—10.9	—3.1			
Production ..	2,719	2,245	2,477		
% increase ..	21.1	—9.7			
Austria—					
Acres	5,104	4,203	4,953	4,551	4,810
% increase ..	21.4	—15.1	8.8	—5.3	
Production ..	63,031	31,663	45,322	36,004	45,132
% increase ..	99.0	—30.1	25.8	—20.2	
Hungary—					
Acres	2,824	2,767	2,689	2,692	
% increase ..	2.0	2.9	0.1		
Production ..	25,935	24,093	28,169	19,358	
% increase ..	7.6	—14.4	45.4		
Roumania—					
Acres	429	406	413		
% increase ..	5.6	—1.8			
Production ..	4,412	3,352	2,644		
% increase ..	31.8	26.7			
Bulgaria—					
Acres	589	473			
% increase ..	24.5				
Production ..	4,700	3,856			
% increase ..	21.8				
Spain—					
Acres	2,144	2,231			
% increase ..	—3.9				
Production ..	14,342	13,525			
% increase ..	6.0				

TABLE V.—*Concluded*

	1910	1900	1890	1880	1870
Total—					
Acres	107,962	106,421	101,821	96,288	80,142
% increase ..	1.4	4.5	5.7	20.1	
Production ..	861,986	801,205	721,828	577,008	442,599
% increase ..	7.5	12.4	23.5	30.6	

TABLE VI.—PRODUCTION OF BEANS AND PEASE, 1870-1910

(Expressed in thousands)

Country	1910	1900	1890	1880	1870
United States—					
Production ..	25,032	16,307	12,757	12,359	10,405
% increase ..	53.5	27.8	3.2	18.7	
United Kingdom—					
Production ..	7,882	7,140	11,244	13,200	16,800
% increase ..	10.3	—36.5	—14.8	—21.4	
Canada. No data.					
New Zealand. No data.					
India. No data.					
Australia. No data.					
Russia in Europe—					
Production ..	45,551	32,737	22,848	36,265	41,403
% increase ..	39.1	43.2	—36.9	—12.4	
Russia in Asia—					
Production ..	884	267			
% increase ..	231.1				
Norway—					
Production ..	130	104	133	139	118
% increase ..	25.0	—21.8	—4.3	17.8	
Sweden—					
Production ..	876	1,460	1,587	1,166	1,125
% increase ..	—40.0	—8.0	36.1	3.6	
Denmark. No data.					
Germany. No data.					
Netherlands—					
Production ..	2,336	3,158	3,016	3,391	3,023
% increase ..	—26.0	4.7	—11.0	12.1	

TABLE VI.—*Concluded*

Country	1910	1900	1890	1880	1870
Belgium—					
Production ..	541	929	1,698	1,478	1,955
% increase ..	—41.7	—45.2	14.8	—24.4	
France—					
Production ..	21,823	19,354	20,279	20,592	20,738
% increase ..	12.7	—4.5	—1.5	—0.7	
Italy—					
Production ..	23,654	15,112	17,763	23,317	22,738
% increase ..	56.5	—17.3	—23.8	2.5	
Austria—					
Production ..	7,736	8,287	7,223	8,195	7,085
% increase ..	—6.6	14.7	—11.8	15.6	
Hungary—					
Production ..	4,458	2,662	1,054	706	623
% increase ..	67.4	152.5	49.2	13.3	
Roumania—					
Production ..	789	439	485		
% increase ..	79.7	—9.4			
Bulgaria—					
Production ..	996	88			
% increase ..					
Algeria—					
Production ..	751	521			
% increase ..	44.1				
Uruguay. No data.					
Argentina. No data.					
Chile—					
Production ..	895	788			
% increase ..	13.5				
Spain—					
Production ..	16,702	12,729			
% increase ..	31.2				
Japan—					
Production ..	128,234	118,558			
% increase ..	8.1				
Total—					
Production ..	289,270	240,640	100,087	120,808	126,013
% increase ..	20.2	140.4	—17.1	—4.1	

TABLE VII.—PRODUCTION OF POTATOES AND OTHER ROOTS, 1870-1910
(Expressed in thousands)

Country	1910	1900	1890	1880	1870
United States—					
Production ..	271,494	187,376	154,700	120,003	
% increase ..	44.8	21.1	28.8		
United Kingdom—					
Production ..	949,740	852,280	866,660	893,000	925,000
% increase ..	15.0	—1.6	—2.9	—3.5	
Canada—					
Production ..	120,243	82,476	63,203	34,272	
% increase ..	45.7	30.4	84.4		
New Zealand—					
Production ..	3,900	3,380	3,560	2,220	1,120
% increase ..	15.3	—5.0	60.0	98.2	
India. No data.					
Australia—					
Production..	8,000	6,400	7,380		
% increase ..	25.0	—13.2			
Russia in Europe—					
Production ..	960,740	497,152	334,088	270,340	229,572
% increase ..	93.2	48.4	23.5	17.7	
Russia in Asia—					
Production ..	18,640	5,791			
% increase ..	221.8				
Norway. No data.					
Sweden—					
Production ..	125,101	67,631	25,405	38,043	30,458
% ncirease ..	84.9	166.2	—33.2	24.9	
Denmark—					
Production ..	180,691	167,558	59,213	14,661	
% increase ..	7.8	182.9	303.8		
Germany—					
Production ..	1,172,800	950,000	820,030	476,301	
% increase ..	23.4	15.8	72.1		
Netherlands—					
Production ..	86,036	77,935	41,159	47,117	34,620
% increase ..	10.3	89.3	—12.6	36.1	
Belgium—					
Production ..	220,800	144,128	96,809	91,309	63,000
% increase ..	53.2	48.8	6.0	44.9	

TABLE VII.—*Concluded*

Country	1910	1900	1890	1880	1870
France—					
Production ..	1,370,120	627,138	582,937	525,821	361,123
% increase ..	118.4	7.5	10.8	45.6	
Italy—					
Production ..	15,000	13,820	14,785	13,861	12,000
% increase ..	8.5	—6.5	6.6	15.5	
Austria—					
Production ..	511,660	377,085	322,848	226,259	193,260
% increase ..	35.6	16.7	42.6	17.0	
Hungary—					
Production ..	318,540	210,936	115,809	82,644	31,261
% increase ..	51.0	82.1	40.1	164.3	
Roumania—					
Production ..	8,142	6,364	872		
% increase ..	27.9				
Bulgaria—					
Production ..	8,400	6,520			
% increase ..	28.8				
Algeria—					
Production ..	1,980	1,740			
% increase ..	13.7				
Uruguay.	No data.				
Argentina.	No data.				
Chile—					
Production ..	5,680	4,640			
% increase ..	22.4				
Japan—					
Production ..	74,740	61,191			
% increase ..	11.1				
Total—					
Production ..	6,432,447	4,351,541	3,509,458	2,835,881	1,881,414
% increase ..	47.8	23.9	23.7	50.7	

TABLE VIII.—PRODUCTION OF CEREALS PER ACRE, 1860-1910
(Expressed in pounds)

Cereal	1910	1900	1890	1880	1870	1860
Wheat	836	748	792	607	638	898
Maize	1,403	1,315	1,461	1,356	1,487	
Oats	886	842	785	824	722	
Barley	928	860	874	797	729	
Rye	798	752	700	559	552	

TABLE IX.—EXPORTS OF CHIEF ARTICLES OF FOOD, 1860-1910

	(Expressed in thousands)					
Country	1910	1900	1890	1880	1870	1860
United States—						
Total value ¹	369,088	545,474	356,830	459,462	92,772	50,791
% increase	—32.3 ²	52.8	—22.3	395.2	82.6	
Animals value	17,448	43,585	33,638	15,882	1,045	1,697
% increase	—59.9	29.5	111.7	1519.8	38.4	
Cattle no.	139	397	395	183	28	28
% increase	—64.9	0.6	116.0	563.8		
Sheep no.	45	126	68	209	40	
% increase	—64.2	85.2	—67.4	422.5		
Beef products lbs.	286,296	674,285	536,986	260,567	64,241	54,128
% increase	—57.5	25.6	106.1	305.6	18.7	
Swine products lbs.	707,110	1,538,024	1,159,643	1,230,702	99,417	107,083
% increase	—54.0	32.6	—5.8	1137.9	—7.1	
Total value of breadstuffs	133,580	262,744	154,926	288,037	72,251	26,989
% increase	—49.1	69.5	—46.2	298.6	167.7	
Corn bu.	38,128	213,123	103,419	99,572	2,140	4,249
% increase	—82.1	106.1	3.9	4552.9	—49.6	
Wheat bu.	87,364	186,097	109,430	180,304	53,901	17,213
% increase	—53.1	70.1	—39.3	234.5	213.1	
Oats bu.	2,549	45,049	15,107	766	122	
% increase	—94.3	198.2	1872.2	527.9		
Barley bu.	4,312	23,662	1,408	1,129	255	
% increase	—81.8	1580.5	24.7	342.7		
Rye bu.	242	2,382	2,281			
% increase	—89.8	4.4				
Fish value	9,652	5,427	6,041	4,019	1,381	882
% increase	77.8	—10.1	50.3	191.0	56.5	
Fruits and nuts value	18,886	11,643	4,060	2,091	543	
% increase	62.2	186.7	94.1	285.0		
Sugar and molasses value	8,658	3,698	3,029	3,340	662	302
% increase	134.1	22.0	—9.3	404.5	119.2	
Vegetables value	4,207	2,853	1,357	795	591	394
% increase	47.4	110.2	70.6	34.5	50.0	
United Kingdom—						
Total value ³	38,945	26,195	23,143	23,594	19,104	11,575

¹ Includes articles of food only. All values for the United States expressed in dollars with (000) omitted.

² A minus sign (—) denotes a decrease in these tables on exports and imports.

³ Includes alcoholic beverages and tobacco as well as articles of food. Values for the United Kingdom expressed in (£) with (000) omitted.

TABLE IX.—*Continued*

Country	1910	1900	1890	1880	1870	1860
United Kingdom—<i>Continued</i>						
% increase	41.0	13.2	—1.9	23.5	65.0	
Meat cwts.	406	566	684	485		
% increase	—28.2	—17.2	41.0			
Grain and flour cwts. ...	8,022	4,912	1,496	2,800	2,600	
% increase	63.3	228.3	—46.5	7.6		
Rice cwts.	1,777	2,565	2,820	3,537	2,222	
% increase	—30.7	—9.0	—20.2	59.1		
Fruits value £	1,002	848	656	837	343	261
% increase	18.1	29.2	—21.6	144.0	31.4	
Fish value £	6,412	3,697	2,298	2,085	916	577
% increase	73.4	60.8	10.2	127.6	58.7	
Tea value £	2,312	1,689	1,742	2,804	2,182	655
% increase	36.8	—3.0	—37.8	28.5	233.1	
Canada—						
Bacon and ham cwts. ...	488	1,350	77	128	125	
% increase	—63.8	1653.2	—39.8	2.4		
Butter and cheese cwts. ..	1,857	2,196	1,107	557	317	
% increase	—15.4	98.3	98.7	75.7		
Fish value £	3,150	2,157	882	1,066	840	
% increase	46.0	144.5	—17.2	26.9		
Flour bbls.	3,064	771	150	561	453	
% increase	297.4	414.0	—73.2	23.8		
Fruit and berries value £	1,151	695				
% increase	65.6					
Grain and pulse bu.	67,166	43,802	22,262	33,490	10,543	
% increase	53.3	96.7	—33.5	217.9		
Cattle and sheep no.	286	665	397	454	376	
% increase	—56.9	67.5	—12.5	20.7		
Potatoes bu.	1,929	681	1,459	1,427		
% increase	183.2	—53.3	2.2			
India—						
Rice cwts.	39,219	32,278	34,963	28,888	10,615	
% increase	21.5	—7.6	21.0	172.1		
Wheat cwts.	21,011	9,704	14,320	19,901	78	
% increase	116.5	—32.2	—28.0			
Coffee cwts.	234	291	242	316	322	
% increase	—19.5	20.2	—23.4	—1.8		
Sugar cwts.	522	891	1,616	373	386	
% increase	—41.4	—44.8	333.2	—3.3		
Tea lbs.	249,901	176,387	105,610	38,406	12,754	
% increase	41.6	67.0	174.9	201.1		

TABLE IX.—*Continued*

Country	1910	1900	1890	1880	1870	1860
Australia—						
Butter lbs.	87,928	44,206				
% increase	98.9					
Flour tons	140	70				
% increase	100.0					
Grain bu.	47,891	13,449				
% increase	256.0					
Meat lbs.	334,725	199,950				
% increase	67.4					
Sugar cwts.	132	170				
% increase	—22.3					
Fruit value £	323	107				
% increase	201.8					
New Zealand—						
Butter and cheese cwts. .	808	275	35	3		
% increase	193.8	685.7				
Grain bu.	1,782	8,929	7,727	5,505	841	
% increase	—80.0	15.5	43.0	554.5		
Meat cwts.	2,631	1,889	959	15	5	
% increase	39.2	96.9				
Potatoes tons	1	13	29	10	2	
Russia—						
Total value roubles	948,650	411,537	404,771	261,621	183,304	
% increase	130.5	1.7	54.7	42.7		
Fowls roubles	12,676	8,658				
% increase	46.4					
Cattle, pigs and sheep no.	112	130		674	487	225
% increase	—13.8			38.3	175.1	
Butter poods	3,479	1,190	293	156	168	177
% increase	192.3	306.1	87.8	—7.1	—5.0	
Corn, flour and meal						
poods	761,939	420,194	365,662	213,513	187,105	109,057
% increase	81.3	14.9	71.2	14.1	71.5	
Norway—						
Butter kilogs.	1,242	1,452				
% increase	—14.4					
Condensed milk kilogs...	14,208	6,628				
Fish kilogs.	74,568	55,138	65,564	72,215		
% increase	35.2	—15.9	—9.2			
Fish hectols.	1,435	1,029	936	665	1,256	

TABLE IX.—*Continued*

Country	1910	1900	1890	1880	1870	1860
Norway—Continued						
% increase	39.4	9.9	40.7	—47.0		
Fish kroner	10,336	3,159	2,528	915	738	
% increase	227.1	24.9	176.2	23.9		
Sweden—						
Cattle no.	33	4	36	19	14	
Butter kilogs.	21,842	19,175	15,044	5,107	5,500	
% increase	13.9	27.4	194.5	—7.1		
Fish kilogs.	53,962	9,420				
% increase	472.8					
Grain kilogs.	2,896	12,993	74,712	285,000	550,000	
% increase	—77.7	—82.6	—73.7	—48.1		
Denmark—						
Cattle no.	141	41	140	85	45	
Butter kilogs.	88,475	61,375	44,621	10,500	6,800	
% increase	44.1	37.5	324.9	54.4		
Fish kilogs.	14,645	11,157	18,722			
% increase	31.2	—40.4				
Grain and flour kilogs..	74,034	57,837	96,107	318,246	374,021	
% increase	28.0	—39.8	—69.8	—14.9		
Sugar kilogs.	1,522	2,524				
% increase	—39.6					
Meat kilogs.			37,438	5,685	9,372	
% increase			558.5	—39.3		
Sheep and swine no.			173	274	33	
% increase			—36.8			
Germany—						
Total value mks.	749,000	518,000	471,000	563,000	389,000	
% increase	44.6	9.9	—16.3	44.7		
Cattle, sheep and swine						
no.	56	176	426	1,946	1,719	
% increase	—68.1	—58.6	—78.1	13.2		
Butter kilogs.	8,486	2,659	70	24,900	25,800	
% increase						
Grain, flour and meal						
kilogs.	2,194,531	1,031,973	1,600,000	2,340,300	2,186,000	
% increase	112.6	—35.5	—31.6	7.0		
Potatoes kilogs.	305,023	180,814				
% increase	68.6					
Sugar kilogs.	710,370	1,006,465	796,400	5\$1,900	26,400	
% increase	—29.4	26.3	58.6			

TABLE IX.—*Continued*

Country	1910	1900	1890	1880	1870	1860
Netherlands—						
Cattle, sheep and swine						
no.	175	128	589	545	511	
% increase	36.7	—78.2	8.0	6.6		
Butter kilogs.	32,866	22,572	39,555	36,052	21,712	
% increase	45.6	—42.9	9.7	66.0		
Cheese kilogs.	55,689	45,908	30,314	28,058	29,232	
% increase	21.3	51.4	8.0	—4.0		
Coffee kilogs.	78,846	75,486	54,562	66,594	79,584	
% increase	4.4	38.3	—18.0	—16.3		
Rish kilogs.	176,748	107,501	88,801			
% increase	64.4	21.0				
Grain and flour kilogs. .	2,387,159	1,453,984	758,585	380,000	71,000	
% increase	66.2	89.3	99.6	435.2		
Rice kilogs.	224,572	90,048	41,283	33,973	18,377	
% increase	149.3	118.1	21.5	84.8		
Sugar kilogs.	97,187	121,554	106,801	66,500	92,701	
% increase	—20.0	13.8	60.6	—28.2		
Belgium—						
Butter kilogs.	1,592	2,620	3,554	4,607	4,733	
% increase	—39.2	—26.2	—22.8	—2.6		
Grain kilogs.	875,436	452,115	503,651	457,176	27,565	
% increase	93.6	—10.2	10.1			
Meat kilogs.	7,786	17,769				
% increase	—76.1					
Sugar kilogs.	38,407	233,254	160,302	60,791	37,488	
% increase	—83.5	45.5	163.6	62.1		
France—						
Total value fr.	858,200	769,200	855,400	666,965	613,100	
% increase	11.6	—10.1	28.2	8.8		
Cattle, sheep and swine						
no.	343	82	175	150	164	
% increase	318.2	—53.1	16.6	—8.5		
Butter and cheese kilogs. .	40,466	33,870	45,274	35,292	21,309	
% increase	19.4	—25.1	28.2	65.6		
Fruit kilogs.	102,648	20,930	84,159	30,750	34,412	
% increase	390.4	—75.1	173.6	—10.6		
Grain and flour kilogs. .	47,800	88,600	98,410	266,613	153,601	
% increase	—46.0	—9.9	—63.0	73.5		
Sugar kilogs.	191,904	587,063	354,854	153,514	179,675	
% increase	—67.3	65.4	131.1	—14.5		
Potatoes tons.	219	198				
% increase	10.6					

TABLE IX.—*Continued*

Country	1910	1900	1890	1880	1870
Spain—					
Animals no.	174	245	74	671	75
% increase	—28.9	231.0	—88.9	794.6	
Fruit and nuts kilogs. ..	597,748	334,884	187,366	45,800	44,872
% increase	78.4	78.7	309.0	2.0	
Olive oil kilogs.	39,311	32,921	14,616	13,022	6,114
% increase	19.4	125.2	12.2	112.9	
Rice kilogs.	4,010	9,495			
% increase	—57.7				
Wheat and flour kilogs. . .	762	2,201	31,743	39,042	50,774
% increase	—65.3	—93.0	—18.6	23.1	
Austria-Hungary—					
Total value £	9,684	13,109	14,650	11,933	
% increase	—26.1	—10.5	22.7		
Cattle, sheep and swine					
no.	132	209	367	743	649
% increase	—36.8	—43.0	—50.6	14.4	
Eggs kilogs.	111,300	108,800	61,000		
% increase	2.2	78.3			
Grain kilogs.	186,300	307,800	755,200	867,400	613,200
% increase	—39.4	—59.2	—12.9	41.4	
Pulse kilogs.	82,200	95,900	64,800		
% increase	—14.2	47.9			
Sugar kilogs.	674,400	657,600	409,200	248,100	65,600
% increase	2.5	60.7	64.9	278.2	
Italy—					
Total value lire	613,219	349,479	255,229	329,202	246,675
% increase	75.5	36.9	—22.5	33.5	
Cattle no.	5	47	22	55	74
% increase	—89.3	113.6	—60.0	—25.6	
Butter and cheese kilogs. .	30,110	18,229			
% increase	65.1				
Eggs kilogs.	20,471	35,740	15,285	25,097	4,877
% increase	—42.7	133.8	—39.1	414.5	
Fruit kilogs.	399,300	199,000	197,590	98,502	80,797
% increase	100.6	0.7	100.6	21.9	
Grain kilogs.	46,000	47,000	60,000	142,200	160,300
% increase	—2.1	—21.6	—57.8	—11.2	
Meat kilogs.	11,358	11,804	7,301	6,052	4,474
% increase	—3.7	61.6	20.6	35.2	

TABLE IX.—*Concluded*

Country	1910	1900	1890	1880	1870
<i>Italy—Continued</i>					
Olive oil kilogs.	28,500	22,900	37,832	57,660	57,835
% increase	24.4	—39.4	—34.3	—0.3	
Rice kilogs.	47,611	46,332	28,626	76,027	86,681
% increase	2.7	61.8	—62.3	—12.2	
<i>Bulgaria—</i>					
Cattle no.	10	20	17		
% increase	—50.0	17.6			
Sheep no.	397	389	365		
% increase	2.0	6.5			
Cheese kilogs.	3,217	2,246			
% increase	43.2				
Eggs kilogs.	9,987	4,560			
% increase	119.0				
Grain and flour kilogs. ..	532,620	246,309	494,654		
% increase	116.2	—50.2			
Haricots kilogs.	17,582	1,525			
% increase	1052.9				
<i>Roumania—</i>					
Cattle no.	9	9			
Grain and flour kilogs. ..	2,186,035	2,398,247	1,753,767	1,319,997	
% increase	—8.8	36.7	32.8		
Haricots kilogs.	36,317	52,667			
% increase	—31.0				
Peas kilogs.	9,494	1,924			
% increase	393.4				
Eggs kilogs.	5,946	4,832			
% increase	23.0				
Fish kilogs.	5,089	4,857			
% increase	4.7				
Sugar kilogs.	3	7,098			
<i>Chile—</i>					
Cattle no.	3	4			
% increase	—33.3				
Sheep no.	2	5			
% increase	—60.0				
Grain and flour kilogs. ..	155,837	35,016			
% increase	345.0				

TABLE IX.—*Concluded*

Country	1910	1900	1890	1880	1870
Uruguay—					
Cattle no.	203	61			
% increase	232.7				
Sheep no.	267	60			
% increase	345.0				
Grain and flour kilogs. ..	100,242	58,487			
% increase	71.3				
Meat kilogs.	48,991	58,125			
% increase	—15.7				
Argentina—					
Cattle no.	90	160			
% increase	—43.7				
Sheep no.	77	198			
% increase	—61.1				
Other animals no.	24	56			
% increase	—57.1				
Butter kilogs.	3,000	1,000			
% increase	200.0				
Grain and flour kilogs. ..	5,030,000	2,702,000			
% increase	86.1				
Meat kilogs.	373,000	85,000			
% increase	338.8				
Sugar kilogs.	56,000	26,000			
% increase	115.3				
Japan—					
Rice lbs.	140,231	185,820	51,320	86,778	
% increase	—24.5	262.0	—40.8		
Tea lbs.	63,518	60,698	49,544	31,373	
% increase	4.6	22.5	57.9		
Fish value \$	3,187	1,392			
% increase	128.9				

TABLE X.—IMPORTS OF CHIEF ARTICLES OF FOOD, 1860-1910
(Expressed in thousands)

Country	1910	1900	1890	1880	1870	1860
United States—						
Total value ¹ \$	326,343	230,944	261,812	218,422	150,235	89,515
% increase	41.3	—11.7	19.8	45.3	67.8	
Animals value \$	7,840	4,531	6,767	3,740	6,421	1,442
% increase	80.1	—33.0	80.9	—41.7	345.2	
All bread-stuffs value \$	12,826	4,083	8,076	8,562	8,540	50
% increase	215.0	—49.4	—5.6	0.2		
Coffee lbs.	871,470	787,992	499,159	446,851	235,257	200,999
% increase	10.5	57.8	11.7	89.9	17.0	
Fish value \$	13,836	7,472	5,289	3,403	2,316	492
% increase	85.1	41.2	55.4	46.9	370.7	
Fruits and nuts value \$	37,424	19,264	22,428	13,271	7,417	4,805
% increase	94.2	—14.1	69.0	78.9	54.3	
Meat and dairy products value \$	11,812	2,285	2,011	1,235	4,649	98
% increase	516.9	13.6	62.8	—73.4		
Sugar value \$	106,349	100,251	89,735	88,752	69,828	36,299
% increase	6.0	11.7	1.1	27.1	92.3	
Tea lbs.	85,626	84,845	83,887	72,163	47,408	30,593
% increase	0.9	1.1	16.2	52.2	54.9	
Vegetables value \$	8,273	2,935	4,455			
% increase	181.8	—34.1				
United Kingdom—						
Total value ² £	257,682	219,970	176,137	183,527	110,969	85,357
% increase	17.1	24.9	—4.0	65.4	30.0	
Sheep no.		383	358	941	670	320
% increase		6.9	—61.9	40.4	109.3	
Cattle no.	220	496	643	390	202	105
% increase	—55.6	—22.8	64.8	93.0	92.3	
Meat cwts.	19,983	17,911	7,129	6,352	898	588
% increase	11.5	151.2	12.2	607.3	52.7	
Grain and flour cwts.	203,782	195,813	155,621	134,173	74,104	56,206
% increase	4.0	25.8	15.9	81.0	31.8	
Rice cwts.	9,938	6,291	5,958	7,890	4,077	1,525
% increase	57.9	5.5	—24.4	93.5	167.3	
Fruits value £	10,987	9,118	8,667	6,895	2,163	1,844
% increase	20.4	5.2	25.6	218.7	17.3	

¹ Includes articles of food only.

² Includes tobacco and alcoholic beverages as well as articles of food.

TABLE X.—*Continued*

Country	1910	1900	1890	1880	1870	1860
United Kingdom—<i>Continued</i>						
Fish value £	4,335	3,621	2,811	1,667	768	395
% increase	19.7	28.8	68.6	117.0	94.4	
Butter, cheese and eggs						
value £	38,602	29,715	19,003	20,478	11,170	6,155
% increase	29.9	56.3	—7.2	83.3	81.4	
Sugar value £	25,751	20,349	18,706	23,369	17,564	12,806
% increase	26.5	8.7	—19.9	33.0	37.1	
Tea value £	11,381	10,687	9,920	11,613	10,098	6,912
% increase	6.5	7.7	—14.5	15.0	46.1	
Canada—						
Flour bbls.	35	57	185	287		
% increase	—38.5	—69.1	—35.5			
Meat and live stock value£	1,149	535	353	352		
% increase	114.7	51.5	0.2			
Coffee lbs.	11,909	4,913				
% increase	142.3					
Rice cwts.	434	264				
% increase	60.6					
Sugar cwts.	5,062	3,198	1,893	1,124		
% increase	58.2	68.9	68.4			
Molasses gals.	6,396	4,395	4,389	2,742		
% increase	45.5	0.1	60.0			
Tea lbs.	33,192	24,999	18,455	13,400		
% increase	32.7	35.4	37.7			
Vegetables value £	270	85				
% increase	217.6					
Fruit value £	677	331				
% increase	104.5					
India—						
Imports of food stuffs into India are so small that they need not be taken account of.						
Australia—						
Coffee lbs.	2,532	2,056				
% increase	23.1					
Butter lbs.	77	396				
% increase	—80.5					
Fish lbs.	17,309	11,823				
% increase	46.4					

TABLE X.—*Continued*

Country	1910	1900	1890	1880	1870	1860
<i>Australia—Continued</i>						
Fruit lbs.	9,885	16,690				
% increase	—40.7					
Grain bu.	154	2,071				
Rice cwts.	595	426				
% increase	39.6					
Milk and cream lbs.	8,543	11,203				
% increase	—23.7					
Sugar cwts.	681	1,520				
% increase	—55.1					
Tea lbs.	36,728	31,847				
% increase	15.3					
<i>New Zealand—</i>						
Fish value £	69	29				
% increase	137.9					
Fruit value £	301	211				
% increase	42.6					
Rice cwts.	76	63				
% increase	20.6					
Sugar cwts.	1,031	808				
% increase	27.6					
Tea lbs.	7,587	5,291	3,849	3,698	1,280	
% increase	43.3	37.4	4.0	188.9		
<i>Russia—</i>						
Total value roubles	190,843	115,733	83,453	132,892	52,317	
% increase	64.9	38.7	—37.2	154.0		
Coffee poods	713	503	388	424	440	343
% increase	41.7	29.6	—8.4	—3.6	28.2	
Fish poods	18,093	6,461	5,431	508	326	281
% increase	180.0	18.9	969.0	54.8	16.7	
Fruit roubles	6,133	4,648	5,941	10,525	6,722	5,034
% increase	31.9	—21.7	—43.5	56.5	33.5	
Rice poods	6,047	2,951	110	760	267	311
% increase	104.9					
Tea poods	4,496	3,493	835	625	543	291
% increase	28.7	318.3	33.6	15.1	86.5	
<i>Norway—</i>						
Bacon and lard kilogs...	1,494	8,320	9,746	5,570	4,200	
% increase	—82.0	—14.6	74.9	32.6		

TABLE X.—*Continued*

Country	1910	1900	1890	1880	1870
Norway—<i>Continued</i>					
Butter kilogs.	363	291	2,849	3,369	3,000
% increase	24.7	—89.7	—15.4	12.3	
Coffee kilogs.	13,423	10,623	8,094	7,167	11,600
% increase	26.3	31.2	12.9	—38.2	
Corn and meal hectol ...	6,432	5,580	3,762	3,939	5,681
% increase	15.2	48.3	—4.4	—30.6	
Sugar kilogs.	46,174	34,106	14,951	8,728	134
% increase	35.3	128.1	71.3		
Sweden—					
Bacon and hams kilogs...	1,066	10,675	8,220	12,000	3,100
% increase	—90.0	29.8	—31.5	287.0	
Coffee kilogs.	29,570	25,500	14,857	12,341	
% increase	15.9	71.6	20.3		
Fish kilogs.	59,648	51,546			
% increase	15.7				
Grain and meal kilogs. ..	283,546	305,007	190,232	199,000	
% increase	—7.0	60.3	—4.4		
Sugar kilogs.	893	12,698	29,968	31,656	24,721
% increase	—92.9	—57.6	—5.3	28.0	
Denmark—					
Cattle no.	19	2	6	21	11
Sheep no.	3	2	25		
Butter kilogs.	5,662	21,183	9,340		
Coffee kilogs.	14,708	19,010	7,856	7,368	6,713
% increase	—22.6	141.9	6.6	9.7	
Fish kilogs.	14,293	17,015	17,412		
% increase	—15.9	—2.2			
Grain and meal kilogs. ..	634,995	630,492	286,110	91,219	30,284
% increase	0.7	120.3	213.6	201.2	
Sugar kilogs.	23,369	33,698	18,842	28,864	24,458
% increase	—30.6	78.8	—34.7	18.0	
Germany—					
Total value mks.	2,467,000	1,763,000	1,397,000	1,258,000	1,009,000
% increase	39.9	26.2	11.0	24.7	
Cattle, sheep and swine					
no.	348	287	1,038		
% increase	21.2	—72.3			
Coffee kilogs.	170,855	160,826	118,100	391,100	313,100
% increase	6.2	36.1	69.8	24.9	

TABLE X.—Continued

Country	1910	1900	1890	1880	1870
<i>Germany—Continued</i>					
Grain and flour kilogs...	6,764,720	4,515,161	3,439,800	4,329,200	3,292,200
% increase	49.8	31.2	—20.5	31.4	
Herring bbls.	1,277	1,135	1,267		
% increase	12.5	—10.4			
Rice kilogs.	448,991	290,554			
% increase	54.5				
Sugar kilogs.			6,000	498,800	171,700
% increase			—98.8	190.5	
<i>Netherlands—</i>					
Coffee kilogs.	120,088	114,487	72,681	96,583	97,110
% increase	4.8	57.5	—24.7	—0.5	
Grain, flour and meal kilogs.	4,642,703	2,981,201	1,320,660	43,852	38,677
% increase	55.7	125.7	2911.6	13.3	
Rice kilogs.	351,345	160,353	132,908	79,468	41,323
% increase	119.1	20.6	67.2	92.3	
Sugar kilogs.	56,649	41,963	111,032	95,006	120,560
% increase	34.9	—62.2	16.8	—21.1	
<i>Belgium—</i>					
Cattle, sheep and swine no.	222	228	363	489	241
% increase	—2.6	—37.1	—25.7	102.9	
Butter kilogs.	5,668	3,632			
% increase	56.0				
Coffee kilogs.	50,152	26,323	21,957	22,755	22,440
% increase	90.5	19.8	—3.5	1.4	
Fish kilogs.	73,734	51,174			
% increase	44.0				
Meat kilogs.	12,226	16,970	27,645	38,627	1,205
% increase	—27.9	—38.6	—28.4		
Grain kilogs.	3,276,594	1,999,264	1,632,738	1,215,231	332,614
% increase	63.8	22.4	34.3	265.3	
<i>France—</i>					
Total value fr.	1,413,000	819,200	1,445,100	1,714,753	691,800
% increase	72.5	—43.3	—15.7	147.8	
Cattle, sheep and swine no.	1,344	1,133	1,344	2,542	848
% increase	18.6	—15.7	—47.1	199.7	

TABLE X.—*Continued*

Country	1910	1900	1890	1880	1870
France—<i>Continued</i>					
Butter and cheese kilogs.	27,069	25,489	19,454	22,885	13,748
% increase	6.1	31.0	—14.9	66.0	
Coffee kilogs.	111,828	81,999	67,912	57,733	76,010
% increase	36.6	20.7	17.6	—24.0	
Fish kilogs.	86,400	78,300			
% increase	10.3				
Fruit kilogs.	211,539	141,370	215,233	169,683	
% increase	49.6	—34.3	26.8		
Grain and flour kilogs..	647,400	150,300	2,057,877	2,905,300	788,492
% increase	348.7	—92.7	—29.1	268.4	
Meat kilogs.	11,948	22,391	39,051	50,790	14,793
% increase	—46.6	—42.6	—23.1	243.3	
Rice kilogs.	285,200	138,800			
% increase	105.4				
Sugar kilogs.	141,802	94,809	143,981	211,074	188,907
% increase	49.5	—34.1	—31.7	11.7	
Spain—					
Animals no.	150	610	102	130	142
% increase	—73.7	498.0	—21.5	8.4	
Fish kilogs.	47,402	42,455	47,403	44,203	29,073
% increase	11.6	—10.4	7.2	52.0	
Coffee kilogs.	12,841	6,005			
% increase	113.8				
Grain kilogs.	161,464	222,625	160,388	29,911	62,502
% increase	27.4	38.8	436.2	—52.1	
Austria-Hungary—					
Total value £	10,000	11,517	7,891	11,208	
% increase	—13.1	45.9	—29.5		
Cattle and sheep no.	18	199	311	339	858
% increase	—90.9	—36.0	—8.2	—60.4	
Coffee kilogs.	59,800	42,400	35,200	31,600	26,500
% increase	41.0	20.4	11.3	19.2	
Grain kilogs.	63,400	182,700	101,000	105,300	155,700
% increase	—65.2	80.8	—4.0	32.3	
Rice kilogs.	138,800	79,900	68,200	57,300	
% increase	73.7	17.1	19.0		

TABLE X.—*Continued*

Country	1910	1900	1890	1880	1870
Italy—					
Total value lire	659,866	290,484	318,921	205,972	218,122
% increase	127.2	—8.9	54.8	—5.6	
Cheese kilogs.	6,695	4,242	7,738	7,490	6,153
% increase	57.8	—45.1	3.3	21.7	
Coffee kilogs.	25,294	14,092	13,982	10,673	12,615
% increase	79.4	0.8	31.0	—15.3	
Fish kilogs.	79,268	45,084	45,665	43,204	31,139
% increase	75.9	—1.2	5.6	38.7	
Grain kilogs.	1,442,000	732,000	645,000	346,200	269,600
% increase	96.9	1.3	86.3	28.4	
Olive oil kilogs.	5,854	17,630	2,518	1,422	4,425
% increase	—66.7	600.1	77.0	—67.8	
Sugar kilogs.	6,546	54,171	91,268	50,985	68,418
% increase	—87.9	—40.6	79.0	—25.4	
Fruit kilogs.				5,551	4,981
% increase				11.4	
Bulgaria—					
Coffee kilogs.	1,519	861	895		
% increase	76.4	—3.8			
Fruit kilogs.	8,244	1,856			
% increase	444.1				
Olive oil kilogs.	2,112	639	1,397		
% increase	230.5	54.2			
Rice kilogs.	4,616	1,432			
% increase	224.3				
Sugar kilogs.	14,585	6,860	9,962		
% increase	112.6	31.1			
Roumania—					
Coffee kilogs.	2,616	1,777	1,275	1,243	
% increase	47.2	39.3	2.5		
Fish kilogs.	8,694	5,063			
% increase	71.7				
Fruit kilogs.	16,639	10,665			
% increase	56.0				
Olive oil kilogs.	5,852	6,182			
% increase	—5.3				

TABLE X.—*Concluded*

Country	1910	1900	1890	1880	1870
Chile—					
Cattle no.	130	28			
% increase	364.2				
Sheep no.	87	9			
% increase	755.5				
Coffee kilogs.	3,883	1,175			
% increase	230.4				
Sugar kilogs.	69,055	50,688			
% increase	36.2				
Uruguay—					
Cattle no.	27	99			
% increase	—72.7				
Other animals no.	57	11			
% increase	418.1				
Coffee kilogs.	1,569	1,004			
% increase	56.2				
Olive oil kilogs.	682	872			
% increase	—21.7				
Rice kilogs.	6,684	5,695			
% increase	17.3				
Sugar kilogs.	21,242	17,719			
% increase	19.8				
Argentina—					
Cattle and sheep no.	69	27			
% increase	155.5				
Olive oil kilogs.	22,145	7,692			
% increase	187.8				
Sugar kilogs.	22,735	459			
Japan—					
Beans and peas lbs.	571,985	225,960			
% increase	153.1				
Fish lbs.	15,279	59,691			
% increase	—74.4				
Flour lbs.	42,418	122,331			
% increase	—65.3				
Rice lbs.	443,089	310,589			
% increase	42.6				
Sugar lbs.	296,738	551,852	230,985	104,561	
% increase	—46.2	138.9	120.9		

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